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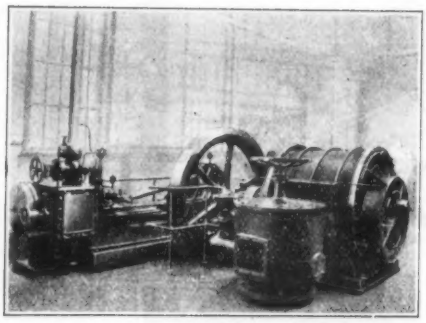

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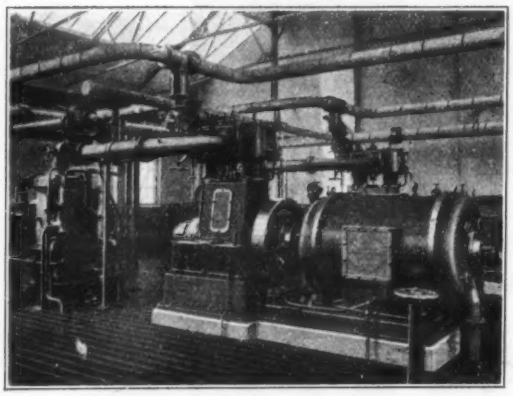

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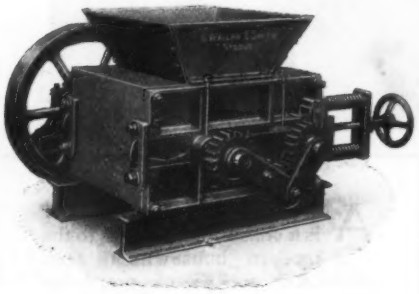

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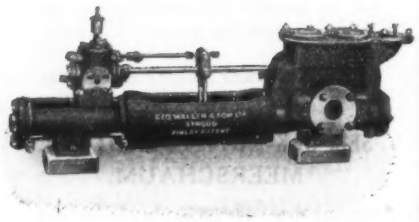

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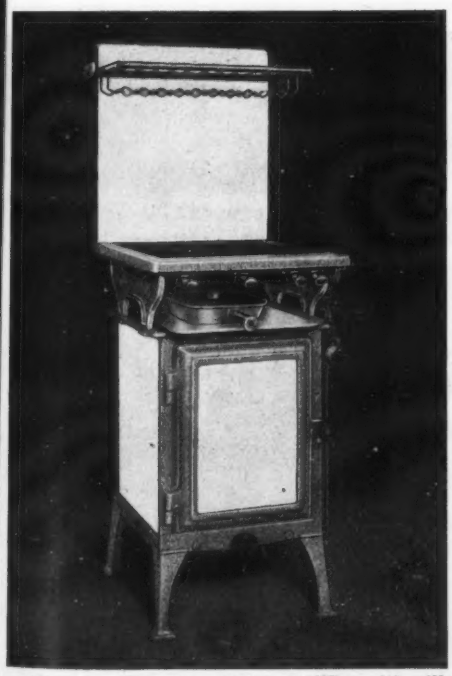

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Gas Journal

MAY 8, 1935

Vol. 210. 87th Year No. 3755.

Editorial Notes

Back to Business

THE Gas Industry will rightly be proud of the part it has played in the Jubilee rejoicings this week, as exemplified in the splendid list of floodlighting installations recorded in our columns last week, supplemented by further details to-day. The efforts of the Jubilee Celebrations Committee have thus been well worth while, and it is particularly gratifying that gas was able to put up such a wonderful spectacle in St. James' Park, which we can regard as being situated at the very hub of the Jubilee celebrations. We believe the Industry will strongly deprecate the attitude of regarding any of this splendid work as good publicity for gas, and, as second to none in loyalty, will have rejoiced in giving, for its own sake, this outward and visible manifestation of its gratitude to the Royal Family.

The inspiration to our heading—"Back to Business"—is the fact that our Jubilee Issue last week contained the Advance Programme of the June Institution Meeting, and that the Industry will be led up to its great event of the year through a hectic May containing the Annual General Meetings of the National Gas Council and the Society of British Gas Industries, a formal visit of the British Gas Federation to the British Industries Fair, and three important senior Association Meetings. So that our columns for the next two months or so will have to eschew the easy pleasantness of floodlighting pictures and loyal reminiscences, and be devoted to the sterner stuff upon which the Gas Industry's future progress will be based.

The Institution Programme

A MONTH from now the Institution Meeting will be in full swing, and judging by the programme the meeting should be one of the most successful ever held, as is fitting in the midst of Jubilee Rejoicings. London this year, of course, will have especial appeal, and so, we think, will the Papers to be presented and discussed. The subjects to be brought forward for consideration are so essentially topical, and their ventilation should have an important influence on the conduct of our Industry in the immediate future. What, for example, is of more present concern than "National Policies Covering the Testing of Gas Appliances"—the title of a Paper to be submitted by Mr. Stephen Lacey and Mr. Masterman? We ourselves have discussed the problem from many angles and have felt for a long time now that far greater co-ordination in the matter of testing is desirable. It is not our intention, however, to forestall the paper, but we feel sure the Gas Industry will gain a lead from what Mr. Lacey and Mr. Masterman have to say. Then what could be more topical than "The Preparation, Marketing, and Utilization of Coke," the subject to be brought forward by Mr. Boon? We are delighted that more and more gas undertakings are realizing that coke dumps on the works are totally unnecessary—greatly to their advantage and that of their consumers of both gas and coke. This subject, as readers of the "JOURNAL" well know, is very dear to our heart. Again, the question of tariffs, discussed in connection with Mr. Ridley's North of England Paper in these columns to-day. For long we have regarded this question as being vital to the prosperity of the Gas Industry; and we anticipate much from "The Gas Account" by Mr. W. B. McLusky, a pioneer in effective gas pricing, an enthusiast with no little originality.

Gas engineers *qua* engineers are catered for by Mr. Dixon, who will describe the reconstruction of manufacturing and distribution plant at Nottingham. And very fine plant this is, too. His paper will be a fitting reminder that part at least of the profits is made in the retort house and conserved in the articulation system. "Profits in the retort house" will also receive attention from Major Gregson, who will show that a therm saved in "waste" heat is in fact a therm earned. And how welcome and refreshing is the balance of the programme. Mr. S. B. Chandler is to deal with the "Development of Gas Sales," as a pointed reminder that the gasholder must not be regarded as permanent storage—that gas is made to be sold.

Not the least interesting and welcome feature of this well-chosen programme is the Lecture to be given by Dr. Arthur G. Glasgow on "The Auxiliary Use of Carburetted Water Gas." The Institution of Gas Engineers is most certainly to be congratulated on having persuaded one of the greatest living authorities on water gas to address its members at "the event of the year." Those who know Dr. Glasgow are aware of his retiring disposition, his dislike of the limelight, and

will be doubly grateful to him for consenting to deliver a Lecture on a necessary " auxiliary."

The Institution President, Mr. C. Valon Bennett, can look forward to a meeting second to none in the long history of The Institution of Gas Engineers. In our Jubilee Number last week we published the Loyal Address of Congratulations submitted to His Majesty by fifteen Engineering Institutions. Among these Institutions our own came fourth in the chronological list, with the year of formation, 1863, appended. The British Gas Federation, speaking for the whole Gas Industry in united voice, offered its humble duty and congratulations to King George; and it was happily appropriate that at this time of national thankfulness the oldest as well as the newest organization within the Gas Industry should express its gratitude and loyalty to the Royal Family.

Finally, we may mention the social arrangements and visits to works and places of interest which have been arranged. Among these visits is one to the Battersea Power Station of the London Power Company, which may on the face of it appear strange to the layman, but will not so appear to the broadminded engineer. And the details of these arrangements? Surely it is sufficient to say that all arrangements are in the hands of Mr. J. R. W. Alexander, which is tantamont to saying that all will be very well indeed.

Creosote

THANKS largely to the Gas Industry, Sir Harry McGowan, in the course of his address last week at the Annual General Meeting of Imperial Chemical Industries, was able to make some very interesting statements in regard to the production of motor spirit by hydrogenation. He explained that the first injection into the plant took place on Feb. 7 last, and that since then " we have been steadily producing petrol from creosote oil and low-temperature tar. This entry into production within eighteen months from the authorization of the scheme reflects great credit on our staff and workers at Billingham." It also, we suggest, reflects great credit on the creosote produced by gas undertakings. We have pointed out in these columns that creosote is a valuable product, and we are pleased to know that our comments have not been without their effect on the market price of creosote.

On April 10 the first cargo of 300,000 gallons of hydrogenated creosote—" equal in quality to the recently improved No. 1 petrols "—left Billingham. We should have been happy to be able to announce that a similar cargo had left, say, the Beckton Works of the Gas Light and Coke Company, for creosote is a delightful raw material for the hydrogenator. Not long ago we were informed by the operator of a hydrogenation unit that there was only one objection to creosote—that if it was spilt on the hands, it hurt! Otherwise there was no trouble whatever in pumping the creosote into the unit and collecting the petrol at the outlet. Imperial Chemical Industries are making excellent use of this fact.

To return to Sir Harry McGowan's statements in regard to the Billingham plant: " We now anticipate that new capital expenditure will amount to some £3,000,000, or £500,000 more than the figure I gave last year. On the other hand, the plant will have an output capacity of 150,000 tons of petrol per annum—*i.e.*, 50% in excess of the original estimate. . . . We shall still manufacture not less than 100,000 tons direct from coal, and any balance from high or low temperature tar oils." This would indicate a fairly hefty " balance," of which the Gas Industry should take due note, bearing in mind that it is a Products Industry—and a very flexible one. It seems to us that the prospects for the Tar Market are bright.

Nor is hydrogenation the only lucrative market for creosote and tar oils. Other possibilities have arisen with the new duty of 8d. a gallon on imported fuel oil for use in diesel-engined road vehicles. In the " JOURNAL " for April 24 we suggested that the Industry should take steps to benefit from this duty of 8d. a gallon. We said: " As yet, owing to their relatively high ignition point, creosote and tar oils have not proved suitable in themselves as fuel for the compression-ignition diesel engine. But just think of that 8d. a gallon! What an enormous reward if, by organized research, the creosote and tar oils were made into a satisfactory diesel engine fuel." And in the same issue we discussed the addition of " dopes," pointing out that the new duty of 8d. a gallon quite alters the outlook as to the practicability of their use. We also mentioned modification of the existing method of distilling tar, and the potentialities of hydrogenation or partial hydrogenation.

But it seems that, in the first sentence quoted in the foregoing paragraph from our issue of April 24, we were too gloomy. Since then we have taken the matter up with one of the most eminent authorities in the diesel engine industry, and we have been informed that ordinary creosote is being used without dopes and without difficulty in a mobile diesel engine of the normal type. Experience is too limited to say more than this at the moment, but if difficulties are encountered there is no reason to suppose that a remedy cannot easily be found by co-operation between the Gas Industry and the engine-maker. We ask for co-operative investigation. The Industry, we suggest, should join in common counsel with other manufacturers of creosote and tar oils, with the tar distillers, and with the diesel engine manufacturers.

Eminent Presidents

IT is with considerable interest that we call attention to a letter from the Society of British Gas Industries, published in our correspondence columns to-day. We hope that the invitation to attend their meeting and hear the Presidential Address of Sir John Cadman will meet with a large acceptance, both as promising a most interesting expression of views by one who is so eminent in the fuel industries of the world, and in recognition of the willingness and determination of the Society to pull its full weight on behalf of the Gas Industry. Since the very wise move which made it a full member of the British Gas Federation, the Society has given more than one sign that it intends to accept its responsibilities very seriously, and we are sure that the Industry will be well advised to encourage this outlook on the part of a group which comprises talent of so many kinds, and can, if it wishes, bring new light to bear on many of the problems connected with future policy.

Of Sir John Cadman personally we need say little. His name and his record speak for themselves, and are sufficient assurance that he will have something of absorbing interest to say. Last year he was the recipient of the Melchett Medal for research of an outstanding character involving the scientific preparation and development of the use of fuel. No higher qualification could be demanded of outstanding fitness to address the Gas Industry at the present juncture. We would, however, refer to the principle of inviting eminent men from outside the Industry as Presidents of such national bodies as the S.B.G.I., and still more to the success of the Society in obtaining their acceptance. For Sir John Cadman, as is well-known, is the latest of a considerable line of S.B.G.I. Presidents who have been leaders in other walks of our national life, and it seems to us that the fact that

they have consented to act, and in every case to play more than a walking-on part, has constituted a series of very happy compliments to our Industry. Moreover, such contact with prominent people outside cannot help to some extent broadening our own outlook, as well as extending the sphere of influence of the Gas Industry.

The British Gas Federation made an excellent start in obtaining the consent of Lord Macmillan to act as its inaugural President. We do not know what is to be its future policy in this respect, but we would humbly submit for consideration some of the points to which we have referred above.

Attractive Tariffs

"We believe that, if we desire to see gas progress and to extend its services generally to all, the application of some system of tariff other than the flat rate must form part of our desire." This from a recent comment in these columns. On several occasions recently we have emphasized the great need, and the urgency, for the adoption of attractive tariffs, formulated in the knowledge that gas can provide services superior to electricity. For years the Gas Industry has asked for a greater measure of freedom in the matter of gas pricing; and quite frankly it came rather as a surprise to us that, when such freedom was granted, new schemes were not generally applied. There had been such a deal of talk about it all.

Our contentions on this matter of gas pricing are strengthened by the considered opinions of one who has done a great deal of investigational work on tariffs and has also put into practice schemes of charging for gas other than at the flat rate. We refer to Mr. Ridley, of the Newcastle Gas Company, who, in a detailed and exceedingly instructive Paper before the North of England Gas Managers' Association on Friday last, expressed his ideas on this all-important question of gas tariffs, and gave his conclusions based upon the actual working of different systems. As we have pointed out, the most appropriate time to make a change in the method of charge is, as Mr. Ridley says, when surplus profits are available for disposal, and "experience clearly indicates that more benefit is derived by the undertaking by releasing revenue for tariff purposes than flat rate reductions, as the flat rate does not provide any incentive to increased consumption, besides perpetuating the lack of equity inherent in that method." There can be no question about this; but there are undertakings which in the immediate present cannot afford to give up a certain amount of revenue. Such undertakings should ask themselves a single question: Can we hope, in face of competition, to maintain existing revenue unless we adopt attractive tariffs? We ourselves have no doubt what the answer to this question is. Adherence to the flat rate means business retrogression; and we are in thorough agreement with Mr. Ridley when he suggests that where sufficient revenue cannot be "risked" to provide attractive tariffs undertakings should seriously consider whether in their local circumstances existing flat rates should not be increased, and thereby enable the introduction of tariffs more attractive than the flat rate.

In any consideration of the "risk" involved, the fact must always be faced that the flat rate is a business loser—that there is, therefore, a loss in revenue by perpetuating it. Such loss must be offset against the assumed "risk." But to our mind the risk involved by the adoption of attractive tariffs looms too large because of lack of confidence in gas service. The Gas Industry's revenue in the future will depend on a smaller profit per therm sold on a larger turnover of total therms. It is folly to imagine that any undertaking which is enjoying a pleasant percentage profit on a snug little turnover will continue to hold this turnover without a drastic change in outlook. There are some undertakings to-day which are simply not trying to gain new business, and it is not too much to say that they are a menace to the Industry as a whole. Their attitude is reflected in every department of their organization, works and district, and it is having its inevitable effect on public opinion and public goodwill towards gas.

Consumption per Consumer

Figures abound in plenty to show that the flat rate, solely employed, is losing business. Taking the industry as a whole the consumption per consumer is decreasing seriously. Mr. Ridley, in connection with his own Undertaking, explains how serious was this decline between the years 1928 and 1933—and no one in the Gas Industry would say that the Newcastle-upon-Tyne and Gateshead Gas Company has ever been anything but progressive in its sales methods. A major remedy for this general decline lies in attractive tariffs; and since tariffs alternative to the flat rate have been operated in Newcastle, Mr. Ridley has come to the conclusion that they have undoubtedly been successful in stopping serious loss. To quote his own words: "I have no hesitation in saying that properly designed tariffs giving a generous bonus in respect of gas taken in excess of standard quantities are undoubtedly an aid to increasing the sales of gas per consumer, and *if the Gas Industry is to show marked progress in the future it will be through the medium of tariffs;* and in my opinion those undertakings which do not provide suitable tariffs cannot hope to develop their sales." The italics are ours.

Of course, the type of tariff it is advisable to adopt depends largely on local circumstances, and the conditions at Newcastle, with cheap coal and intense electrical competition and where there are very many small consumers and a very few large ones, have necessarily had their bearing on the tariffs put into operation by the Newcastle Company. None the less, what Mr. Ridley has to say will prove of the greatest value to other undertakings tackling the tariff problem. We agree with the author in his contention that the step rate is out of date and not so effective as a block or two-part tariff in negotiating new business; and we agree with him, too, that the ultimate object must be to get the last block price, and in the case of a two-part tariff the commodity price, down to such a figure as will make attractive the use of gas for continuous domestic space and water heating and full industrial application. In our opinion attention to coke sales will bring this promise earlier of fulfilment. Also, as we have several times emphasized, attractive tariffs should not be confined to the ordinary consumer, but should be extended equally to the prepayment consumer. We have previously called attention to the large increase in revenue from coke sales enjoyed by gas undertakings in 1934; and it is quite reasonable to expect, assuming that in the light of experience during the past year still greater attention will be paid to manufacturing and marketing good solid smokeless fuel, that the revenue from coke will show a satisfactory advance this year. This anticipated increase in revenue should act as an inducement to undertakings to take a business "risk" in adopting more attractive tariffs for gas.

Newcastle's Scheme

We have mentioned our surprise that, after all the talk about "antiquated shackles," so few undertakings were ready to operate new tariffs when freedom was granted last year. Newcastle, however, was fully prepared and acted promptly, which pioneer work gives added weight to Mr. Ridley's account. As a matter of fact, as long

ago as 1930 the Newcastle Company introduced an optional two-part tariff—a service charge of 10s. per quarter, and a commodity charge on the block system at a rate substantially below the "published" price. This tariff applies to both domestic and industrial consumers, but those domestic consumers who contracted on the tariff have since transferred to a new tariff put into operation during the final quarter of 1934. In regard to the industrial and commercial consumers, though those who have so far contracted on the two-part tariff are comparatively few in number their consumption in 1933 represented 44% of the total gas sold for industrial purposes.

Newcastle's new "domestic tariff" is a block system embodying three factors—"assessable rooms," winter and summer consumption, and discount upon prompt payment. There are three blocks, the first block being charged at the published flat-rate price, the second at a substantial reduction, and any in excess also at a further reduced price. The amount of gas a consumer must take before the second block charge becomes operative depends on the number of "assessable rooms" in his house and also on whether it is summer or winter. For example, if there are four or less "assessable rooms," then the consumer pays during the winter months for the first 30 therms at the published, or flat-rate, price, the next 30 therms are charged at 1½d. per therm less, and any in excess at a further reduction of 0·7d. per therm. During the summer months the first block is 20 therms and the second block also 20 therms.

The amount of the first block varies directly with the number of assessable rooms. Starting from four rooms the blocks are graduated to fifteen rooms or over—from 30 therms in the winter quarter, as we have mentioned, to 140 therms, and the second block throughout the scale is the same quantity as the first block. Thus a consumer occupying a four-room house obtains quick relief—the desirability of which we have emphasized time and again in these columns—and full relief after consuming 60 therms in winter and 40 therms in summer. On the other hand, to obtain first relief a man who occupies a 15-room house must consume 140 therms, and to obtain full benefit no less than 280 therms in winter and 240 therms in summer.

The Newcastle system of charge is not an optional scheme, but, obviously, in no case could it result in an increase in price to any consumer; and the principle of applying a reduction in price to a new form of tariff more attractive than the old flat-rate charge is without question the right one. Again, every consumer in the area supplied by the Company has an incentive to use more gas in the summer months. When the new tariff was introduced we suggested that it would prove of enormous assistance to the gas salesman and a bulwark against competition. In his Paper Mr. Ridley explains that many cases are known where existing appliances which were not previously in use have been brought into service and greater use made of appliances already connected as a direct result of the tariff. It has also been found that the block tariff has been very helpful in obtaining extended public lighting contracts for increased numbers of lamps and larger consumptions per lamp. "What is not known in regard to the tariffs," says Mr. Ridley, "is how much consumption has been retained which would have been lost but for the introduction of the improved methods of charge." This is an extremely important point to bear in mind.

Mr. Ridley's helpful Paper emphasizes—as we have stressed on several occasions—that extra business will not be gained if the Gas Industry expects customer demand to *precede* the offer of attractive tariffs and first-class service facilities.

Congratulations

ONLY as we went to press last week did the news reach us of the award to Mr. F. J. West, C.B.E., of the Walton Clark Medal, 1935, and the Industry will wish to join with us in this first opportunity of congratulating him upon such an outstanding distinction. Mr. West is such a true son of the British Gas Industry that he will be the last to grudge it a sense of participation in the honour, and when it is remembered that the Medal is awarded only in such years as it is deemed to have been earned, and that it is given to "the Author of the most notable advance in knowledge, or improvement in apparatus, or in method, concerning the science or the art of Gas Manufacture, or distribution or utilization in the production of illumination or of heat, or of power," the Industry may well feel grateful to him for bringing the honour to Great Britain.

Forthcoming Engagements

May.

11.—SCOTTISH JUNIOR ASSOCIATION (EASTERN DISTRICT).—Annual General Meeting. Paper by Mr. D. L. Dickson.

13.—I.G.E.—Finance Sub-Committee, 1.45 p.m.; Membership Sub-Committee, 2.15 p.m.; General Purposes Committee, 3 p.m.

14.—I.G.E.—Council Meeting, 10 a.m.; Gas Education Executive Committee, 4 p.m.

14.—N.G.C.—Meeting of Central Executive Board at the Hotel Metropole, 12 noon.

14.—N.G.C.—Annual General Meeting, Hotel Metropole, W.C. 2, 2.30 p.m.; Special General Meeting, 3 p.m.

14.—FEDERATION OF GAS EMPLOYERS.—Meeting of Central Committee, Hotel Metropole, 11.15 a.m.; Annual General Meeting, 3.15 p.m.

15.—S.B.G.I.—Council Meeting, 11.15 a.m.; Annual General Meeting, Hotel Metropole, 2.45 p.m.

15.—B.C.G.A.—Meeting of the Executive Committee, 11 a.m.; General Committee, 2.30 p.m.

15-16.—EASTERN COUNTIES GAS MANAGERS' ASSOCIATION.—Spring Meeting at Stamford.

16.—B.C.G.A.—Yorkshire District Conference at York.

16.—MIDLAND ASSOCIATION.—Spring Meeting at Hereford.

17.—SOUTHERN ASSOCIATION (WESTERN DISTRICT).—Commercial Meeting, Rougemont Hotel, Exeter, 2.30 p.m.

18.—YORKSHIRE JUNIOR ASSOCIATION.—Meeting and Paper by Mr. C. A. Newham.

22.—BRITISH GAS FEDERATION.—Luncheon at B.I.F., Birmingham.

23.—SOUTHERN ASSOCIATION (EASTERN DISTRICT).—Meeting at 28, Grosvenor Gardens, 2.30 p.m.

23.—WALES AND MONMOUTHSHIRE ASSOCIATION.—Annual Meeting, Royal Engineers' Hall, Llanelly. Presidential Address of Mr. H. Barker.

28.—NATIONAL JOINT INDUSTRIAL COUNCIL FOR THE GAS INDUSTRY.—Annual Meeting, 28, Grosvenor Gardens, S.W. 1, 12 noon.

29.—B.C.G.A.—Midland District Conference at Worcester.

June.

3.—I.G.E.—Finance Sub-Committee, 1.45 p.m.; Membership Sub-Committee, 2.30 p.m.; General Purposes Committee, 3.15 p.m.; Council Meeting, 4.30 p.m.

4-7.—I.G.E.—Annual General Meeting in London.

11.—I.G.E.—Gas Education Executive Committee, 4 p.m.

19.—ASSOCIATION OF STATUTORY INSPECTORS OF GAS METERS.—Annual General Meeting, County Hall, Westminster, 10.15 a.m.

20.—I.G.E.—Refractory Materials Joint Committee, Stoke-on-Trent, 2.30 p.m.

22.—LONDON AND SOUTHERN JUNIOR ASSOCIATION.—Summer Visit to Winchester.

25.—SOUTHERN ASSOCIATION.—Visit to Guildford.

26.—I.G.E.—Oral Examinations in Gas Engineering and Gas Supply, Board of Examiners, 9.30 a.m.

Personal

Out of 153 applicants, Mr. ALEXANDER MCLACHLAN, C.A., of Glasgow, has been recommended by Glasgow Corporation Gas Committee for the post of Secretary and Treasurer to the Department. The appointment is a new one, designed to take the place of that of Accountant and Cashier to the Department, rendered vacant by the retirement on superannuation last November of Mr. J. B. Ferguson.

* * *

A presentation was made at the Hendon Works of Sunderland Gas Company by the Technical Staff of the Company to Mr. W. O. KIRKWOOD, Chief Chemist, to mark the occasion of his forthcoming marriage. Mr. Charles Dru Drury, Engineer and Director, in handing over the gift, which consisted of a canteen of cutlery, referred to Mr. Kirkwood's service with the Company, extending over a period of 14 years, and pointed out that he was successful in obtaining one of the four first-class diplomas in gas engineering awarded by the Institution of Gas Engineers in 1932. Messrs. A. H. Bagshaw (Works Manager, Hendon) and C. F. Barrow (Distribution Superintendent) also spoke.

* * *

Mr. SAMUEL CUTLER has been elected a member of the Executive Committee of the Bribery and Secret Commissions Prevention League, Incorporated.

* * *

After having resigned, through illness, a position as a Director of the Penzance Gas Company, Ltd., which he first accepted during his Mayoralty of the town, Mr. W. H. LANE has been reappointed to the post, the vacancy having meanwhile remained unfilled.

* * *

Mr. M. M. GILLESPIE, M.I.E.E., of Gillespie & Beales (Norfolk Street, Strand, W.C. 2), has recently been appointed to the Board of Messrs. J. Browett Lindley (1931), Ltd., engine and compressor manufacturers.

* * *

We learn that Mr. W. WILSON is vacating his appointment as Engineer and Manager of the Burton-on-Trent Corporation Gas Department on June 1, having been invited to join the Board of the Caledonian Gas Corporation, Ltd., of 4, Albyn Place, Edinburgh, and having been also appointed their Technical Director and Managing Director. It will be recalled that the Caledonian Gas Corporation was formed in February of this year for the purpose of acquiring gas undertakings in Scotland.

* * *

Mr. R. E. BRADDOCK, who was on the Board of Meters, Ltd., until last year when he retired, has been made a magistrate for Oldham. He is also a member of the firm of Messrs. J. & J. Braddock, Globe Meter Works, Wellington Street, Oldham.

* * *

Mr. J. M. EDNEY, who for the past quarter of a century has been Secretary of the Berwick and Tweedmouth Gas Company, has intimated his resignation from this position at an early date.

Obituary

The death occurred on April 24 of Mr. H. A. READ, of Illingworth, who was for twenty-two years Secretary and a Director of Messrs. W. H. Sismey & Co., Ltd., Carbonizing Engineers and Contractors, of Halifax, previous to which he was gas-works representative for the Leeds Fireclay Company, Ltd. Mr. Read was a prominent freemason, being a member of the Northern Star Lodge No. 3053, a P.M. of Edward VII. Lodge No. 3148 (Altrincham), a P.Z. of the Stone of Friendship "Ezel" Chapter of Stockport, and a Past Provincial Officer of Cheshire Grand Lodge. He was also a lay-reader in the Wakefield Diocese. Requiem Mass was celebrated at St. Andrew's Church, Holmfield.

* * *

His many friends in the Gas Industry will extend their sympathy to Colonel W. M. CARR, O.B.E., T.D., of Stretford, whose mother, Mrs. Mary Carr, died at Hough Green, Widnes, on May 4.

Correspondence

Society of British Gas Industries

SIR,—The Thirtieth Annual General Meeting of the Society will be held at the Whitehall Rooms, Hotel Metropole, Northumberland Avenue, W.C., on Wednesday, May 15, and at 3.30 p.m. Sir John Cadman, the President, will deliver his Presidential Address.

The Address, entitled "The Future of Gas," will undoubtedly be of great interest, and I am requested to convey a most cordial invitation to all members of the Industry to be present to hear it.

We shall be grateful if you will kindly convey this invitation to your readers through the medium of your columns.

Yours, &c.,

M. W. BURT,
Manager and Secretary.

Society of British Gas Industries,
56, Victoria Street,
London, S.W. 1,
May 2, 1935.

Benzole Refining

SIR,—In reply to Mr. W. H. Hoffert's contribution in the Correspondence Columns of the "GAS JOURNAL" for April 17, we would like to say that the benzole treatment of which an account appeared in the "JOURNAL" of April 3 seems to us infinitely less an "elixir of life" or philosopher's stone than the inhibitor process appears to be.

First of all, our new reagent permits the refining of crude benzole to be carried out in a rational manner, and it is possible to follow and control the reactions step by step in removing the unwanted compounds. Also, the application of the reagent does not involve any doubt as to the final outcome of the operations.

We are extremely sorry that, on account of the patent position, we cannot at the present time give details of the reagent itself, beyond the fact that it is reasonably cheap and can be regenerated with trifling losses. We are, of course, willing to disclose everything to interested parties on guarantees of absolute secrecy.

In regard to Mr. Hoffert's complaint about plain numbers designating the various strengths of reagent, we think that employing the Greek alphabet always deepens the mystery, and this is not done in the Guards. With all due respect to Mr. Hoffert, if he can make his old friend sulphuric acid do what we have done, we shall be surprised.

We are very curious as to the real action of the inhibitor agent. We are searching for light, but, though our work is not yet finished, we can definitely say that Mr. Hoffert's dream will shortly come true. If the inhibitor phenomena are capable of a relatively simple explanation, we should be much obliged to Mr. Hoffert for one on different lines to those we are following.

We are much indebted to Mr. Charles Cooper for his pertinent and constructive criticism. We have now, thanks to the courtesy of the General Manager, Mr. Foot, and the Chief Chemist, Mr. Hollings, of the Gas Light and Coke Company, been able to examine a benzole extracted from the gas by means of active carbon, as well as benzole from gas by means of wash oil, this latter from the Copenhagen Municipal Gas-Works through the kindness of Mr. Jul. Hansen. We can state that both these light benzoles behave in exactly the same manner towards the new reagent as do the tar benzoles we have dealt with.

We are grateful to Mr. Cooper for suggesting certain lines of research in regard to the sulphur in benzole, to which lines we shall certainly pay due attention in the future. We can, however, state that the standard copper strip test does not give any indication of active sulphur being present in the refined benzole.

We hope to obtain the consent of the Gas Light and Coke Company, as well as the Municipal Gas-Works at Copenhagen, to publish the result of our investigations on their various benzoles.

As Mr. Cooper said, the variations in the specific gravity

of the benzoles treated with varying strength of reagent are rather puzzling, but a reasonable explanation will probably be found later on.

We have not yet completed our work on the inhibitor benzole. There are certain anomalies of a major character, particularly the susceptibility to the variations in partial pressures during evaporation of the inhibitor-treated benzole in the pyrex dish—variations that have been made purposely to study the matter.

It appears to us that in benzole we have two kinds of gum, more or less corresponding to those gums found in gas—namely, liquid phase and vapour phase gum. In benzole there are those gums which are oxidizable, protected by an inhibitor shield, and those formed by polymerization, the latter being volatilized by the depression of their boiling-points by the presence of the inhibitor in sufficient quantity. This possibility seems reasonable to us, for the gum in the gas is undoubtedly part and parcel of the benzole bodies in the gas.

If the originators of the inhibitor process are willing to throw some light on this subject, we should be very much interested, as it would greatly assist in comparison of data.

Bearing in mind the importance of the subject, not only from the point of view of benzole and gas, but in connection with the millions of tons of cracked motor spirit used annually all over the world, the whole problem assumes great proportions, and is well worth a little trouble.

Yours, &c.,

CARL A. HAHN. HARALD NIELSEN.

Danish Gastechnical Laboratory,
Copenhagen, F.,
April 30, 1935.

Loyal Address to His Majesty

The following is the text of a Loyal Address of Congratulations submitted by the British Gas Federation to H.M. the King on the occasion of the Silver Jubilee of his Accession to the Throne:—

To the King's Most Excellent Majesty.

May it please Your Majesty,

The British Gas Federation, representing the Gas Industry of Great Britain and Ireland, offers its humble duty and begs to congratulate Your Majesty on the completion of the twenty-fifth year of Your Reign, and to assure Your Majesty that the members of the Federation share the joy and satisfaction with which your people celebrate the anniversary and join with them in praying earnestly for the continuance of the life and health of Your Majesty and Her Majesty the Queen and the members of the Royal Family.

I have the honour to remain,

Your Majesty's most faithful and devoted subject,

(Sgd.) DAVID MILNE-WATSON,

Chairman of the Council of the British Gas Federation.

News in Brief

To Encourage Prompt Payment of gas accounts the Dumfries Town Council have decided to allow 2½% discount on all accounts settled within 14 days of rendering, the payments to be made at the office of the Collector of Rates in the Municipal Chambers.

Not Inappropriately, as the Mayor of the Borough of Wandsworth, Councillor Evan Rees, J.P., is the Assistant Engineer to the Wandsworth and District Gas Company, the Council House, East Hill, S.W., and the Mayor's private residence have been floodlighted by gas during the Jubilee Celebrations.

According to the Journal of the Fuel Society of Japan, the Keihin Coke Company, of Tokio, which is now operating 40 coke ovens of a modified Koppers type, has decided to extend the plant with the object of carbonizing a further 600 tons of coal per day. The coke will, it is stated, be supplied for blast furnace and foundry use and the gas to the Tokio Gas Company.

A Gas Exhibition, held under the auspices of the Lanark Gas Department, was opened on April 30 by Provost Keith, who paid a tribute to the work of Mr. J. Stewart, the Gas Engineer and Manager. Messrs. R. & A. Main, Ltd., and Messrs. Milne & Mitchell were the manufacturers of the various exhibits on view. Cookery demonstrations were also given during the Exhibition.

The Somewhat Serious Fire which occurred on Sunday morning at the works of Messrs. Sidney Flavel & Co., Ltd., of Leamington, has not, we understand, in any way affected production or deliveries—the damage being confined to the Office Buildings. It is impossible to say to what extent the firm's records have been destroyed, and they would appreciate, therefore, if all customers who have outstanding orders would forward copies of them.

The 30th Annual Meeting of the Wales and Monmouthshire Association of Gas Engineers and Managers will be held on Thursday, May 23, at the Royal Engineers' Hall, Llanelly, under the Presidency of Mr. Harold Barker (Engineer and Manager of the Llanelly Gaslight Company). In addition to the routine business, Mr. Barker will present his Presidential Address, following which Mr. D. Walter Davies (Tredegar) will give a Paper entitled "Continuous Vertical Retorts for Small Undertakings."

An All-Gas Exhibition House has been opened on the Irish Homes Estate at Stillorgan Road, County Dublin, by the Alliance and Dublin Consumers' Gas Company and has in the first weeks attracted thousands of interested visitors.

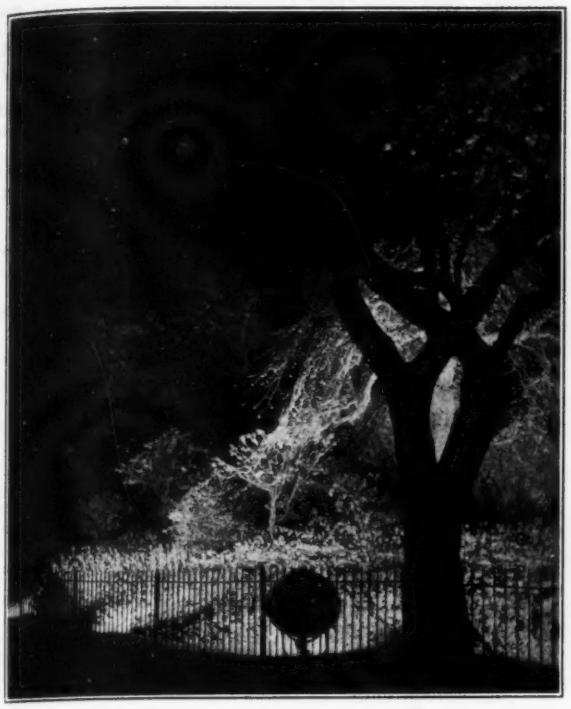
Gas Fires at Half Price during Jubilee Week are being offered by the Macclesfield Corporation Gas Department to celebrate the Jubilee of the King and Queen. As there will naturally only be a limited number on offer, orders will be accepted in strict rotation.

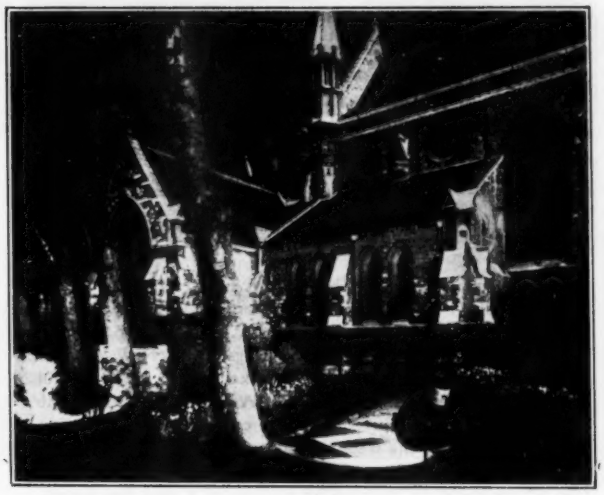
A Loan of £100,000 for the Belfast Corporation, to meet anticipated capital expenditure in the development of the Gas Undertaking, has been sanctioned by the Ulster Ministry of Home Affairs. Gas-fired boilers are to be substituted for coal-fired boilers for the heating of the Belfast City Hall. The tender of the Town Gas Boilers (Bonecourt), Ltd., for two boilers for the sum of £735 *plus* £1 15s. per day for the services of a skilled engineer at the installation has been accepted.

The Kidderminster Gas Company was formed in the early part of the 19th century, and Kidderminster was one of the first towns to have the benefit of the new discovery. From that time well over a century ago the Company has served Kidderminster, and in celebration of the Jubilee there are set forth in bold relief—on the illuminated decoration over the showrooms—the six sovereigns who have since ruled the Empire—George III., George IV., William IV., Victoria, Edward VII., and George V. The idea is a novel one, and when floodlighted the display makes an effective splash of light and colour.

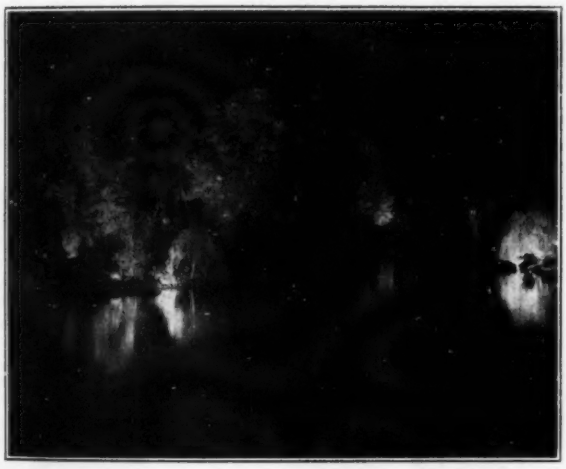
A Distribution of Local Awards in connection with the B.C.G.A. Kitchen Planning Competition was made at Smethwick recently by Mrs. S. Smith, wife of the Chairman of the Gas Committee. Miss Calvert, one of the national prize-winners, comes from Smethwick, and in addition to this the Gas Committee offered three further prizes to local consumers, whose entries were judged by Sir Francis Goodenough. These prizes consisted of modern gas appliances, and after the distribution a cookery demonstration was given by Miss E. J. Linford, of Radiation, Ltd.

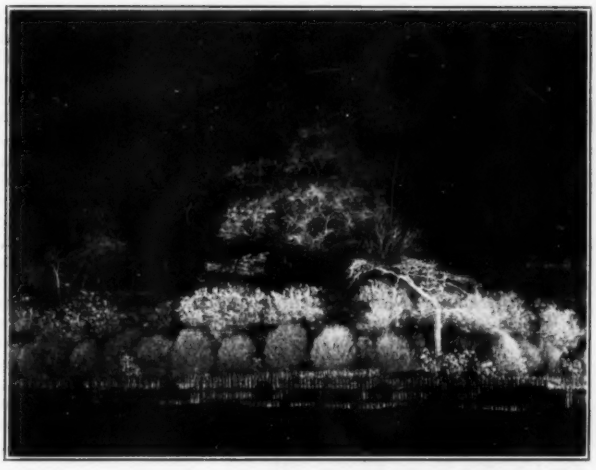
GAS FLOODLIGHTING IN THE METROPOLIS





If gas cannot be said to be carrying out the bulk of London's floodlighting during the festivities of this Jubilee Week, it can nevertheless lay claim to being the medium for the most unusual and at the same time the most remarkably effective of all the illumination schemes. We refer, of course, to the lighting of St. James's Park, three views of which are reproduced on this page, showing the outstandingly beautiful effects which have been obtained by the Gas Light and Coke Company. Our fourth illustration (above right) shows the floodlighting by gas of St. Mary Abbott's Church, Kensington.





Silver Jubilee Gas Floodlighting

We published in last week's "JOURNAL" a list of buildings and other places to be floodlighted by gas throughout the country.

To-day we give a further list based upon information available up to the end of April, 1935, and supplied by the Secretary of the Jubilee Celebrations Committee (Mr. J. R. W. Alexander, 28, Grosvenor Gardens, London, S.W. 1).

Accrington.—War Memorial, Accrington, War Memorial, Clayton-le-Moors, Church Memorial, Gatty Park, and Town Hall.
Bradford.—Bowling Park and Peel Park.
Brigg.—War Memorial.
Bury.—Fusilier Statue and Whitehead Tower and Shrubbery.
Chesterfield.—Gas Showrooms.
Dorchester.—Barracks Keep.
Droitwich.—Railway Bridge, Birmingham Road, and Raven Hotel.
Edinburgh.—Donaldson's Hospital.
Hebden Bridge.—Mytholmroyd War Memorial.
Kirkburton.—War Memorial.
Leamington.—Hitchman Fountain, Pump Room, and Waterfall, Mill Bridge.
Maldon.—St. Peter's Church.
Newburgh.—War Memorial.
Porthcawl.—Gas-Works and Grand Pavilion.
Ramsbottom.—St. Andrew's Church.
Rawmarsh.—War Memorial.
Rotherham.—Chantry Chapel.
Shrewsbury.—St. Chad's Church.
Sunderland.—Royal Infirmary.
Bristol.—Gas Offices.
London.—Scenic hoarding, Acton, Alexandra Hotel, Clapham, Lambeth Town Hall, Baptist Chapel. West Norwood, St. Luke's Church, West Norwood, and West Norwood Brotherhood Institute Building.
Luton.—Drill Hall and Parish Church.

An Attractive Gas Cooker Window Display

The photograph reproduced above shows an attractive gas cooker window display in the Warrington Corporation Gas Department's Showrooms, produced by Messrs. Fletcher, Russell, & Co., Ltd., of Warrington and London, for their "Kingsway" "New World" gas cookers. Bearing the slogan "Take a Step to Successful Cooking—Choose a 'Kingsway' 'New World' Gas Cooker," the display, which has been prepared in full colours, depicts a young housewife mounting the steps to the cooker, with her right hand touching the "Regulo" control knob. The display has the advantage of conveying its message by the use of a very few words, which can be read in an instant; and the use of steps serves the double purpose of elevating the cooker to make it more prominent, while linking up with the slogan "Take a Step to Successful Cooking."

Gas Beacons at the Crystal Palace

Jubilee Illuminations

With the co-operation of the Trustees of the Crystal Palace, the South Suburban Gas Company has erected three gas beacons above the roof of the building. One of these beacons is located above the highest part of the centre transept, a height of 180 ft. above the Crystal Palace Parade, and the other two are situate one at each end of the centre transept at a height of 120 ft. above the ground. These flares form the corners of a triangle having a base 200 ft. long and a height of 60 ft. As a basis of comparison, the highest beacon is 38 ft. further from the ground than the top of the Nelson monument at Trafalgar Square. The height of this beacon from sea level is 540 ft. —that is, over 100 ft. above the level of the top of St. Paul's Cathedral and the top of Shooters Hill.

These beacons together give an approximate illumination of 45,000 candle-power, and can be seen for many miles around London. It is fitting that coal gas manufactured by the South Suburban Gas Company should be burned, bearing in mind that the Company has supplied gas in the district unfailingly for over eighty years. As a point of interest, the Company was known as the Crystal Palace District Gas Company from 1854 until 1904, when the name was changed to the present one.

The beacons were lighted one hour after dusk on May 6, and were extinguished at midnight. The same procedure is to be adopted throughout the week ending on Saturday next.

North of England Gas Managers' Association

The imperative need for an immediate revision in the methods of charging for gas was urged in the discussion which followed the reading of a Paper entitled "Gas Tariffs" by Mr. T. P. Ridley, Commercial Manager and Secretary of the Newcastle and Gateshead Gas Company, at the Annual Meeting of the North of England Gas Managers' Association held in the County Hotel, Newcastle, on Friday, May 3. The Paper is published on later pages.

There was an excellent attendance, presided over by Mr. R. H. Duxbury, of South Bank.

The following new members were elected: Cecil Rhodes Armitage, Engineer and Manager, British Gaslight Company, Ltd., Hull; R. D. Armstrong; G. J. B. Cox, J. E. McManus, E. N. Reed, Newcastle and Gateshead Gas Company; S. W. Robson, North Shields Gas-Works; Wm. Sutcliffe, Newcastle and Gateshead Gas Company, and W. E. Weatherley, Gas-Works, Hexham.

The President referred to the death since the last meeting of Mr. C. H. Armstrong, of Newcastle, and Mr. J. Hudson, of Pickering, Yorks.

It was decided to give the usual contribution of 10 guineas to the Benevolent Fund of The Institution of Gas Engineers.

The following officers were elected for the ensuing year:

President.—Mr. W. M. Galleway, Engineer, Manager, and Secretary, Whitby Gas Company.

Vice-President.—Mr. J. Corrigan, Penrith.

Committee (three vacancies).—Mr. A. H. Bagshaw, Sunderland; Mr. J. E. Blundell, Carlisle, and Mr. R. W. Nicholls, Durham.

Hon. Secretary and Treasurer.—Mr. H. D. Lees, Hexham.

Hon. Auditor.—Mr. A. Pickering, South Shields.

Society of British Gas Industries

Golfing Circle Meeting

The S.B.G.I. Golfing Circle is holding its Spring Meeting at Coombe Hill Golf Club, Surrey, on Monday, June 3, and cordially invites golfing members of The Institution of Gas Engineers attending the 72nd Annual General Meeting of The Institution to take part in the Competitions on that day.

The programme will be as follows:

During the day—18 Holes Medal Play for the "Thornton Victory Cup," with a separate Prize for visitors presented by Mr. C. Valon Bennett.

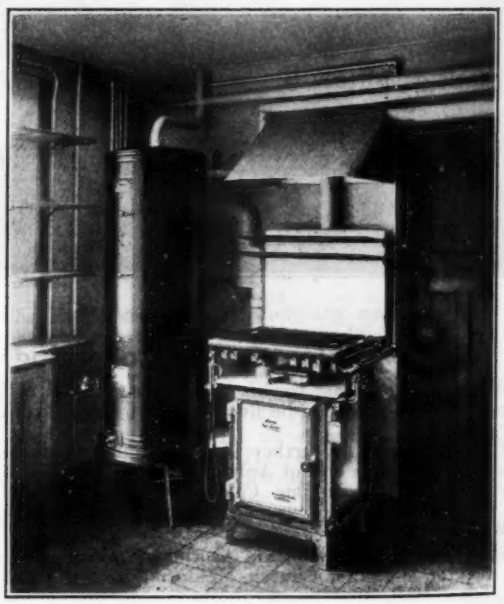
Afternoon only—18 Holes Foursomes against Bogey, for Prizes presented by a member of the Circle.

Tee off as soon after 9.30 a.m. as possible, and cards in both Competitions are returnable by 6 p.m. An optional Sweepstake of 2s. 6d. will be held in conjunction with each Competition.

The Coombe Hill Golf Course is conveniently situated, in beautiful surroundings, within a few minutes' taxi or omnibus journey from Norbiton or Malden Stations, which are served by frequent trains from Waterloo (Southern Railway). Caddies, lunch, and tea will be available at reasonable charges, and the green fee will be 3s. 6d.

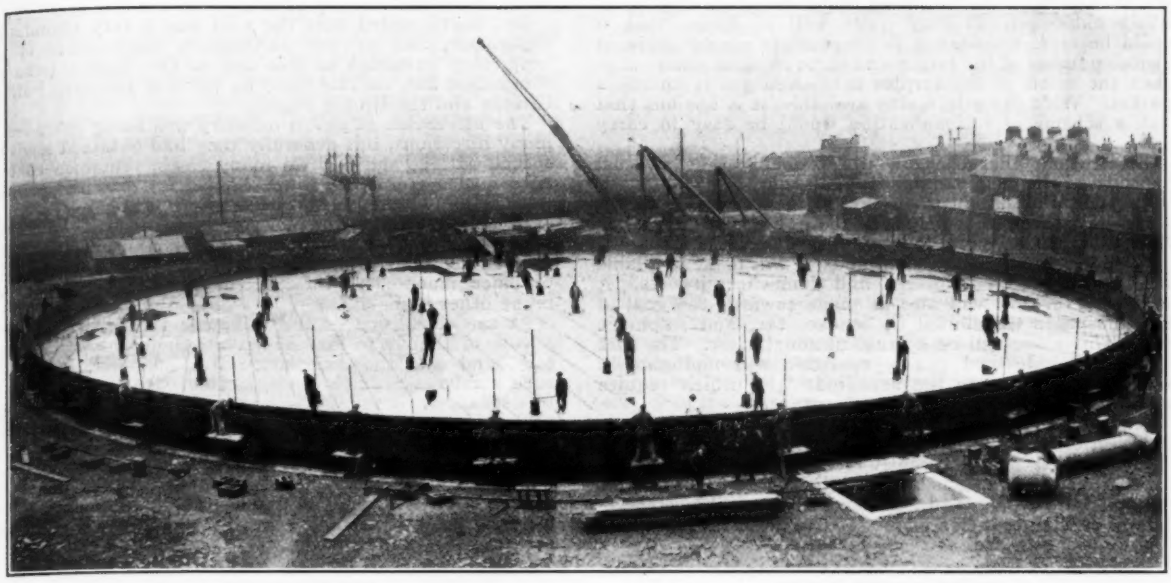
Members of The Institution wishing to enter are asked to write, before May 31, to the Honorary Secretary and Treasurer, W. R. Edgar, Blenheim Works, Hammersmith, W. 6.

A Modern Gas Kitchen



Our photograph shows an example of a modern gas kitchen carried out by the Thetford Gas Company. The appliances are an "Acme" "New World" gas cooker and a "Sun" water heater, supplied by Messrs. Arden Hill & Co., Ltd. (Radiation Ltd.) The canopy, and the particularly neat plumbing and gasfitting work, are particularly noteworthy.

Middlesbrough's New Gasholder



[*Photograph by the "Northern Echo."*

Reference was made in the "JOURNAL" for Sept. 19 last to the fact that sanction of the Ministry of Health had been received by the Middlesbrough Corporation Gas Department for the borrowing of £44,804 for the provision of a new gasholder. Our photograph shows the 280-ton base of the holder, which is being constructed by Messrs. Clayton, Son, & Co., Ltd., of Leeds, being lowered into position. This operation took 90 minutes to perform, and nearly 80 men, stationed at special screw jacks, gave one turn at a signal from the foreman, and the tank bottom gradually settled on to its concrete foundation. The holder will have a maximum height of 200 ft. when completed.

Visit to the Cannon Iron Foundries

Midlands District Salesmen's Circle

A very pleasant and instructive visit was paid by the members of the Midlands District Salesmen's Circle to the Works of Cannon Iron Foundries, Ltd., at Deepfields, near Bilston, on Tuesday, April 30.

On arrival at the works, the visitors were received by Mr. R. Talbot Clayton, the Managing Director, and subsequently entertained at lunch in the pavilion facing the Works Sports Ground. The Chairman of the Company, Sir Francis Pepper, J.P., who presided, extended, on behalf of the Directors and management, a cordial welcome to the visitors, and expressed the hope that during their tour round the works they would see much that would interest them. He took occasion to remark, anent their recent conversion into a public Company, that there would be no break in the continuity of the management, as the Clayton family were maintaining their connection with the business with which they had been associated for over one hundred years.

Mr. B. GREEN (Stourbridge), the Chairman of the District Circle, on behalf of the members, thanked the Company for their hospitality and for the opportunity of inspecting the works.

After lunch, the party assembled in one of the shops devoted to the Chemical Industry side of the Company's business, and witnessed the process of enamelling the interior of a two-and-a-half ton acid container.

The visitors were then divided into small parties, each in charge of a guide, and made a complete tour of the works devoted to the production of cookers, fires, radiators, and other gas appliances for which the Company are well-known.

The works are thoroughly up-to-date and self-contained, and the tour was so arranged that the visitors were able to follow the various stages of manufacture and assembly from the production of castings in the foundry to the finished apparatus. Of particular interest was the minute inspection to which all component parts are subjected before assembly; the complete apparatus being finally tested before passing to the dispatch department.

Not the least interesting feature of the Company's works equipment are the laboratories. Housed in a separate spacious building, these are in charge of the Works Chemist, Mr. W. E. Benton, and are equipped with every modern device for the carrying out of research work.

On completing their tour of inspection, the visitors returned to the pavilion, where tea was served.

On the proposition of Mr. F. A. C. PYKETT (Coventry), seconded by Mr. SHELLEY (Walsall), well merited thanks were accorded to the members of the Company's staff who had acted as guides.

Before departing, each visitor was presented with a souvenir bearing his initials.

This visit was the first occasion on which Sir Francis Pepper had appeared officially as Chairman of the new Company, and the firm are appropriately regarding the occasion as the official opening of their new Laboratories and Research Kitchen and do not intend to hold any other inauguration ceremony as was originally intended.

Proposed Lanarkshire Gas Grid

In the "JOURNAL" for April 10 last we published, in connection with the meeting of the North British Association of Gas Managers, a report of a short Address given by Dr. Birkett Wylam, who has investigated the possibilities of creating an area gas grid in the industrial districts of Lanarkshire and Renfrewshire. As then mentioned, Dr. Wylam's views were submitted to Sir Arthur Rose, Commissioner for the Special Areas in Scotland.

Copies of Dr. Wylam's report have been circulated for perusal among members of Glasgow Corporation Gas Committee. In his report he states that he is convinced it is essential that steps be taken to provide an outlet for the surplus coke oven gas which will shortly become available in the area. It is feasible and practical, he contends, to distribute this gas by means of an area grid. "Coke oven gas," he says, "will be available from two main sources—from Gartsherrie and Auchengeich in Lanarkshire and from Govanhill in Glasgow;" and he indicates how these industrial concerns can be linked up with the gas undertakings of the various local authorities in Lanarkshire and Renfrewshire.

Dr. Wylam proceeds:

"It is suggested at the moment to proceed with only part of the whole scheme, as it is anticipated that the more

ambitious proposals would not be economically sound with the amount of gas available at the start. It must be the aim of the gas scheme to place upon the gas the minimum possible capital charges and running expenses. If more gas becomes available in the future, then the grid area can be extended, the grid being designed with a view to its future extension. It may quite well be found that it would be more economical to concentrate manufacture at a small number of the larger and more efficient plants even when the whole of the surplus coke oven gas is finding a market. With the grid mains available, it is obvious that such a scheme of rationalization would be easy to carry out."

He mentions that Glasgow will probably take at least one-third of the gas available from all sources.

The daily maximum production of the gas undertakings which have been considered is about 276,000 therms, of which Glasgow accounts for 220,000—80% of the total.

"The gas grid," Dr. Wylam adds, "will make available cheap gas for both industrial and domestic purposes. A great step forward will also be made towards the goal of an atmosphere unpolluted by smoke, tar, and sulphuric acid. This alone will be a great national asset. The fact that cheap industrial gas is available will undoubtedly assist in attracting to the area industries which require gas or where gas heating is an advantage."

Moderates in Glasgow Corporation unanimously approve of a West of Scotland gas grid.

The Socialist group recently declined an offer to the Corporation of cheap gas from William Dixon, Ltd., and William Baird & Co., Ltd., of Lanarkshire, ironmasters.

Many of the group are understood to be in favour of the creation of a gas grid.

Midland Junior Gas Association

Annual Meeting

There was an excellent attendance of members at the Annual Meeting of the Midland Junior Gas Association held at the Gas Offices, Birmingham, on May 2, 1935.

After the Annual Report and Statement of Accounts had been accepted, the PRESIDENT (Mr. J. H. Wainwright, Halesowen) announced that the Council had elected Mr. E. T. Pickering (Birmingham) as Junior Vice-President.

Mr. PICKERING, in reply, said how much he appreciated the honour. He had been a member of the Association for the past 20 years and had profited greatly by his membership, and he was glad to be called upon to take a more active part in the good work of the Association.

A vote of thanks, proposed by Mr. S. K. HAWTHORN (Birmingham) and seconded by Mr. BROCKBANK (Walsall), was accorded to Messrs. E. L. Wallis (Dudley), H. C. Wills (Birmingham), and W. L. S. Spinks (Birmingham), the retiring members of the Council.

A vote of thanks was passed to the following Officers of the Association:

Mr. A. Hill, Hon. Secretary,
Mr. F. A. Grant, Assistant Hon. Secretary,
Mr. G. W. Smith, Hon. Treasurer,
Mr. W. P. Timbrell, Hon. Auditor,

and these Officers were re-elected for a further twelve months.

The meeting had to elect two members to serve on the Council, and the President intimated that Mr. H. C. Wills, who was appointed to the Council two years ago to fill a vacancy caused by the promotion of a member to the position of Vice-President, was eligible for re-election. Nominations were called for, and Mr. H. C. Wills (Birmingham) and Mr. W. Hind (Coventry) were elected to the Council.

A hearty vote of thanks, proposed by Mr. S. K. HAWTHORN and seconded by Mr. F. L. ATKIN, was accorded to Messrs. H. R. Hems, W. McNaughton, F. A. Jenkins, and W. L. S. Spinks, for the services rendered by them during the past year in connection with the Education Scheme, the name of Mr. W. J. Pickering who represented the Joint Council of the Junior Gas Associations on the Executive Committee of the General Education Committee, being included in the vote.

The above-named gentlemen were elected to serve for a further twelve months.

Mr. H. R. HEMS suitably replied to the vote of thanks.

A Talk on America.

After the formal business of the meeting, Mr. A. W. SMITH (the General Manager of the City of Birmingham Gas Department) gave a brief description of his recent visit to Canada and the United States, illustrated by interesting lantern slides. These were mainly descriptive of the various cities visited, and included among photographs of "sky scrapers," typical scenery, &c., were slides depicting industrial heating appliances, showroom window displays, gasholder purging plant at Montreal, and many other illustrations of interest to the Gas Industry.

Mr. Smith stated that the visit was a very stimulating experience, and he was particularly appreciative of the hospitality extended to him and to Dr. Walter (who accompanied him on this tour) by the Gas Industry both in Canada and the United States.

The utilization of gas in industry was being extended in many directions, but generally they had obtained loads by special rating, and had, in many cases, remained content with furnaces of much lower efficiencies than those which were being installed in this country.

He also referred to the pleasing appearance of the pressed steel "gas ranges" which were sold in America (the latest pattern including a built-in radio set); the general adoption of office machinery; their Home Service activities, and many other items of interest.

At the conclusion of the talk, the PRESIDENT proposed a vote of thanks to Mr. A. W. Smith for his stimulating talk, and said the Association was honoured by having such a talk as a finish to the session. The vote of thanks was seconded by Mr. F. L. ATKIN (Birmingham) and supported by Mr. J. C. MANN (of the Midland Tar Distillers).

Mr. A. W. SMITH said it had given him very much pleasure to be present. He was a member of the first Council of the Midland Junior Gas Association, and although he was unable to be present at many of the meetings he always took a keen interest in the work and progress of the Association.

Window Cookery Demonstrations

Useful Publicity Scheme at Croydon

A valuable piece of publicity work has just been undertaken by the Croydon Gas Company, which is creating a considerable amount of interest in the town.

The Company have secured for the period of a month a commodious window in Messrs. Allder's Arcade, which is one of Croydon's most popular shopping centres, and they have turned this window into a beautifully laid out gas kitchen, in which continuous cookery demonstrations are carried on. That the equipment is all of the very latest may be gauged from the fact that much of it is of the same style as that adopted in the kitchen of the King's House. The whole is executed in a pleasing finish of silver grey, while a dummy window at the back, above the stainless steel sink, looks out upon a beautiful garden, giving an air of brightness and cleanliness to the whole effect.

The equipment of the kitchen includes a New World cooker in a charming blue and cream "Beau" finish, with which the demonstration cooking is carried out, two gas-operated refrigerators—a "Minor" model built into the sink ensemble and a larger L.D.B. model standing on its own. There is also an "Equator" storage water heater, while a 2¼-gallon "K.C.U." heater in chromium finish supplies the hot water requirements of the sink. All the small fittings are chromium plated, and the whole effect is very pleasing, the Peerless kitchen cabinets completing the general scheme.

Continuous Cookery Demonstrations.

Lady demonstrators take it in turns to carry on continuous cookery demonstrations, which are attracting enormous public attention, while the demonstrations, which must, of course, be silent by reason of the glass which intervenes between the demonstrator and the audience, are illustrated by word and sketch executed on an adjacent sheet by one of the British Commercial Gas Association lady artists, thus effectively taking the place of the spoken word.

Most of the cakes and biscuits, &c., which are prepared in the course of the demonstrations, are sold to the public at attractive prices, which create a ready demand.

The whole display is forming a real centre of interest in this busy part of Croydon, and affords yet another way in which to bring prominently before the public the many services that gas can render in the modern home. The spectacle of this perfectly equipped modern gas kitchen will certainly arouse the envy of many housewives—and envy is one of the first stages leading up to the "will to possess."

The Company are linking up this display with their "Brighter Kitchens" campaign, and as a Jubilee gesture they are offering "new stoves for old" at a special discount of 10% off ordinary prices, with an additional allowance for the consumer's old cooker.

The "Vertiflood" Gas Floodlighting Lamp

This lamp, illustrated here, is a compact and efficient unit for general floodlighting purposes, the overall dimensions being 14½ in. in width, 13½ in. in height, and 19 in. in depth.

The lamp casing is constructed throughout of stout gauge copper, all joints being close riveted. The burner is of brass throughout with the exception of the superheater box, which is of cast iron and carries eight long "bijou" type mantles arranged in staggered formation. The burner mixing chamber and the gas and air regulators are housed in a compartment at the back, which is entirely closed off from the main body of the lamp.

The "Vertiflood" Lamp.

The reflector, of special design, is made of heat resisting silvered glass and is carried in an enamelled steel cradle. This cradle has a single point fixing on either side, rendering the adjustment of same easy and speedy. This adjustment is so arranged that the direction of the beam can be set from a practically vertical position and at various points through an angle of roughly 45°.

The front glazing is of heat-resisting armour-plate glass and can be inserted or withdrawn in a moment. The external finish of heat-resisting cellulose paint can be of any colour to harmonize with the surroundings, the standard colours being black, brown, or grass green. The maximum beam candle-power is approximately 2,500.

A large number of these lamps are in use for the Jubilee Celebrations for the floodlighting scheme in St. James' Park, London.

The lamp as illustrated has a frame with legs attached for fixing on the ground, but brackets or column fixing types can be supplied. For a variety of general purposes they will be found very successful, and are particularly suitable for the illumination of large posters, hoardings, and show houses on building estates, as they can be situated very close to the subject to be lighted.

The makers of the lamp are Messrs. William Edgar & Son, Ltd., Blenheim Works, Hammersmith, London, W. 6.

A Useful Motor Cycle Vacuum Outfit for Gas Undertakings

Improvements in the 1935 Model

The Allan Taylor motor cycle vacuum outfit provides an effective method of dealing with defective pressure and poor gas supplies, and as such forms a useful piece of equipment for the distribution department of gas undertakings.

The outfit is a very mobile unit, mounted on a reinforced Enfield motor cycle with specially constructed side-car chassis. The vacuum tank is constructed of galvanized iron and is of 12 cu. ft. capacity. The exhauster unit, which is driven from the engine, creates a vacuum of 27½ in. of mercury in the tank in one-and-a-half minutes. The unit comes into operation simply by the turning of a tap, and its operation thoroughly cleans service pipes of water rust, and naphthalene, which are all sucked into the vacuum tank. The use of this apparatus definitely removes these obstructions, and does not merely blow them back by a force pump.

As the tank is detachable, it can be taken out of the side-car, and the outfit then becomes a useful and economical means of transport, carrying loads up to 5 cwt.

The makers also supply with this outfit their patent boring device, which can be used in conjunction with the vacuum unit. This boring apparatus is designed to pass round elbows and bends while rotating, thus removing all corrosion adhering to the walls of the pipes.

The motor cycle engine is a 570 c.c. single cylinder side-valve unit, with specially designed detachable aluminium cylinder head. Two camshafts operate directly on to large diameter flat-base tappets. This year's model also contains a number of improvements on previous outfits, one of which is the new type of gearing case which adds to the silence of the machine. A new type of clutch has also been fitted, and has already been proved to be very satisfactory. The unit is supplied complete with 60 ft. of 1-in. reinforced rubber hose, Rookwood unions, vacuum gauge, exhausters, pillion seat, and many other details, and is marketed by Messrs. Allan Taylor Engineering and Manufacturing Company, of 126-138, High Street, Wandsworth, S.W.

The New Parkinson Gas Cooker

The introduction of the Parkinson Stove Company's new gas cooker, which has since aroused so much interest and favourable comment in connection with its installation in the kitchen of the King's House, was announced in the "JOURNAL" in January of this year.

This model, which has been styled the "R.A." cooker, is now in general production, and a few technical details of its design will be of interest to our readers. Illustrations of the cooker have been published in the "JOURNAL" for Jan. 23 (p. 192) and for April 10 (p. 93), the latter showing two of these units in the King's House, with a Benham hotplate and warming chamber between.

Parkinson's "R.A." Cooker.

The "R.A." model is revolutionary in design, and art allied to science has resulted in a cooker worthy of a place in the most up-to-date kitchen. Its pleasing lines and smooth exterior are in keeping with modern architectural tendencies, and make it equally attractive as an independent unit, or built-in as an integral part of the kitchen.

The cooker consists of a large oven, with a twin burner grilling chamber built on the top, and a boiling burner hotplate over the grilling chamber. The hotplate burners are mounted in steel bowls with loose top bars, and the entire hotplate is enclosed, with the result that any spillage is trapped in the bowls, which are easily removed for cleaning. The two-burner oven is controlled by a thermostat of unusual design, operated by a red bakelite knob, the numbers being visible through a small circular window. Drop doors are fitted with strong and carefully balanced spring returns. Each burner is fitted with a locking control tap and automatic ignition, so that any burner can be ignited by pressure of a small button control.

A governor is fitted to the gas supply pipe, maintaining a constant pressure of gas to the cooker.

The "R.A." cooker is available in several attractive colour finishes.

The Painting of a Modern Oil Refinery

A very attractive brochure has been published by Nobel Chemical Finishes, Ltd., associated with Imperial Chemical Industries, Ltd., which illustrates and describes the painting of a modern oil refinery.

The plant treated is that of Lobitos Oilfields, Ltd., of Ellesmere Port, Cheshire, and a definite colour scheme was maintained throughout the complete job on tanks, lines, and pumps, for ease in distinguishing groups of products. A paint had to be chosen which was sufficiently durable to give maximum protection to metal surfaces and, where light product containers were concerned, maximum heat deflection. In addition, a special petrol-proof paint was used on the under sides of light product tank roofs for protection against the formation of iron oxides and iron sulphides, while special paints were also used in the laboratory on the agitators and on hot surfaces.

For this work "Dulux" paints were adopted to meet these requirements, this material being capable of withstanding rough usage without chipping or scratching—the roofs of the tanks being frequently walked upon—of protecting the surfaces from rust, of minimizing evaporation losses in hot weather, and of permitting re-painting after long exposure without burning off the old paint.

The painting of this modern oil refinery called for a thorough and systematic cleaning of the steelwork in order that the greatest advantage should be obtained from the protective qualities of the paint materials used, and pneumatic wire brushes, operated by air delivered from large compressors, produced a burnished surface on which to apply the special primer. The application of the primers was of great importance, particularly during March and April, when it was necessary to seal the surfaces effectively and prevent the action of moisture on bright steel. The primer was brushed and provided an excellent ground for the finishing coats to be sprayed. The hardening period of the primer was an important factor when it is realized that a certain type of tank necessitated the use of 30 tons of light tubular scaffolding, which had to be struck and re-erected as soon as possible, and the rapid hardening of the "Dulux" primer enabled the spray gun to come into its own.

The application of the finishing coats was practically a one-man job, and getting 120 yd. per gallon with "Dulux" aluminium from a spray apparatus in the hands of a speedy and experienced man was a great offset to the increased cost of the pneumatic cleaning process. The first coat of aluminium was dry and hard for the second coat to follow in twelve hours. Actually it was hard in a shorter period than this, but the twelve hours fitted in usually with the progress of the work.

The uniformity of colours in the many types of materials used, the minimum amount of thinning required (in the case of "Dulux" greys), and the rapid hardening of the paint film, which was a great boon during wet weather, allied to a vigorous and thorough preparation of all surfaces, contributed collectively to what is, in the opinion of the painting contractors responsible for the job, the most nearly perfect external painting contract which it has been their privilege to execute.

Legal Intelligence

The Gas Service Company

Police Court Proceedings

At the Westminster Police Court on Thursday, May 2, Mr. E. B. Kelsey was summoned at the instance of the Board of Trade in respect of alleged contravention of the provisions of the Companies Acts. Mr. R. Woodley appeared for the Board of Trade and Mr. R. E. Borneman appeared for the defendant.

Mr. Woodley said that the summonses were in respect of a Company known as the Gas Service Co., Ltd., of 47, Victoria Street, London, S.W. 1, of which the defendant was a Director, the charge being that he knowingly and wilfully permitted letters or circulars to be sent out by that Company without intimation that it was in liquidation or that a receiver and manager had been appointed. He explained that the Gas Service Company, Ltd., was incorporated in July, 1933, with a nominal capital of £100 divided into 100 £1 shares, to carry on the business of gas engineers, and one of the signatories to the Memorandum and Articles of Association was the defendant. On Sept. 1, 1933, a debenture was registered and on Oct. 31, 1934, a Receiver was appointed—viz., Frank Kelsey, one of the other Directors of the Company, that apointment being made by Mr. T. Edwards under the power contained in the debenture.

According to the last return made in October, 1934, the Directors of the Company, and the only shareholders, were T. Edwards, F. Kelsey—who had been appointed Receiver—and the defendant, E. B. Kelsey, who was described as a gas engineer. There had been issued 70 shares, of which the defendant held 68 and the prosecution submitted that he was the person who was carrying on the business at the date of the alleged offences. Of the other two Directors, one was an estate agent and the other a chartered accountant, and they were carrying on businessses at different addresses from that of the Gas Service Company, Ltd. On Dec. 8, 1934, a compulsory Order for the winding up of the Company was made by the Courts, but, notwithstanding that a Receiver had been appointed and a compulsory winding-up Order had been made, certain correspondence had been carried on by the Company using letter headings which did not indicate that this was so, as provided by the Companies Acts. As the defendant had signed these letters, the prosecution submitted that he was the person against whom action must be taken. On the occasion of the first meeting of creditors, however, the defendant submitted to the Official Receiver a statement on letter heading which complied with the Companies Acts in every respect, and it was therefore suggested that this letter heading was specially prepared for this occasion.

Evidence was then called as to the receipt of correspondence in the ordinary course of the post by various people, and it was pointed out to the Magistrate how this correspondence did not comply with the Acts.

Mr. BORNEMAN, for the defendant, submitted that under the Section of the Companies Acts dealing with this matter no action could be taken against the defendant. He pointed out that it was laid down that upon the appointment of a Receiver and Manager or the granting of an Order for compulsory winding up—or even in the case of a voluntary winding up—all documents relating to the particular company must bear an intimation of the fact, and that no director, manager, or secretary should knowingly and wilfully act otherwise. The position, however, was that when an Order for compulsory winding up was made all the Directors ceased automatically to be Directors and therefore at the dates complained of the defendant was no longer a Director of the Company. Moreover, at least in one case he had signed the letter as "chief engineer" and therefore not as a director, manager, or secretary.

Mr. WOODLEY, for the Board of Trade, pointed out that the Receiver and Manager was, in fact, a former Director of the Company, and although he might not have formally replaced the defendant on the Board he must have been aware that the defendant was continuing to control the business. In a sense that was a passive re-appointment of the defendant as a Director, and therefore the defendant was liable.

After Mr. WOODLEY had referred to authorities in support of the view he had submitted,

The MAGISTRATE (Mr. Hackett) said he was bound to dismiss all the summonses, as it was clear the defendant was no longer a Director of the Company. He refused to make any order as to costs.

A Criticism of the Electricity Grid

"The Case Against 'Self-Government' in Industry" was the title of an address given by Lieut.-Col. Sir Arnold Wilson, M.P., at the Sixteenth Annual Dinner of the Chemical Engineering Group of the Society of Chemical Industry.

Sir Arnold referred to the electricity grid, which, he said, had been completed at vast cost "by virtue of the legislative authority of Government." He knew of no one who was prepared to state with certainty what, if any, economies had resulted or would result in the near future, comparable with the cost. The scheme was based on the assumption that generating costs were all-important, and costs of distribution were secondary. The scheme might or might not be good, but Sir Arnold was not satisfied that it would of itself help to reduce the costs of electric power, or that private enterprise, given freedom from the dead hand of antiquated legislation of the past, would not have put the same capital expenditure to better uses.

"I do not question the need for planning," said Sir Arnold, "or for re-organization. I claim that to succeed it must be voluntary and not imposed from above. I do not doubt the need for centralized selling; it has sometimes, but not always, succeeded. But once it becomes compulsory it becomes rigid, a new vested interest arises. We are trying to do more governing and more controlling than any nation can undertake with success," asserted Sir Arnold. "In doing so we are in danger of wasting our greatest asset—the independence of character which is the product of real responsibility. Is the extra 'efficiency' worth obtaining at the cost of character and self-reliance? Is the status and security of a paid man who may lose his job in the biggest firm when times are hard so much better than the status of the independent shopkeeper, who still gets and keeps business because he studies his customers and they trust him?"

Gas Tariffs

by
T. P. RIDLEY

In a Paper before the North of England Gas Managers' Association on May 3, Mr. T. P. Ridley, F.C.I.S., Commercial Manager and Secretary of the Newcastle-upon-Tyne and Gateshead Gas Company, gave much assistance to those who may be considering the introduction of new tariffs.

When your President asked me in July last to give at your meeting to-day a Paper on Methods of Charge I agreed—provided that in the interim too much had not been said or written to make a Paper on the subject redundant. A great deal of a useful character has been spoken and written since the request was made, but not many figures relating to the probable benefits to consumers by the introduction of various tariffs have been submitted, and as the subject is vital to the Industry I venture to express some general views and particularly to submit some tariffs calculated from concrete analyses of consumers and consumptions of gas and to show the financial results of applying such tariffs on the basis (*a*) that all consumers to whom any tariff would be advantageous would avail themselves of it, and (*b*) that no immediate variation in the sale of gas would occur, although, of course, one would expect to get some increased sale. My hope in submitting the Paper is that it will assist those who may be considering the introduction of new tariffs, by saving them investigation along lines which the information contained in the Paper may indicate are unsuitable in their local circumstances.

At the present time the most important problem with which the Gas Industry has to deal is how to increase the consumption of gas per consumer, and the question arises can appropriate new tariffs materially aid in achieving that object or at least in arresting any decrease in the consumption per consumer that may be taking place?

Gas Undertakings Act, 1934.

The Gas Legislation Committee's Second Interim Report states that the arguments for departing from the present system of charge are (*a*) the necessity for enabling undertakers to offer attractive terms for the expansion of the application of gas, and (*b*) the necessity for enabling undertakers to prevent the loss involved in furnishing supplies of gas to uneconomic consumers from falling in so large a measure on economic consumers.

In order to carry these objects into effect the Gas Undertakings Act, 1934, should have provided, in accordance with the unanimous recommendation of the Committee, for the making of a minimum charge—a power which is very common in the sister industry. Such a power, if put into operation, would provide revenue which would enable an undertaking to offer more attractive terms to its economic consumers at present bearing an unfair share of standing charges. In a known case, if the recommendation of the Committee had been adopted and a minimum price applied, provided the consumption per consumer remained the same, a sum equivalent to 0·2d. per therm on the total gas sold would have been available for such a purpose. In the same case, where the consumption per prepayment consumer is small, it was found, after a very careful analysis of costs, that the large industrial and commercial consumers were providing revenue which ought to have been provided by prepayment consumers to an extent equivalent to 0·6d. per therm on the total sales of the undertaking.

Notwithstanding this important omission, the Act gives a great measure of freedom, and the writer would strongly urge—indeed it is an obligation laid on the management of every undertaking—that careful consideration be given to the question of whether the sales of gas per consumer can be increased by a change in the existing method of charge. The production of a suitable tariff for any undertaking cannot be done in an hour or two. It requires the collection of a large amount of data and then a great deal of study in order to construct the most suitable tariff for the particular undertaking. In some cases it may not be difficult to set down on paper a tariff which would be attractive and desirable, but the financial result of such may be that—even with a large amount of courage—the risk is too great to be taken. A tariff has then to be sought which will be within the financial possibilities of the undertaking and at the same time be attractive to as large a number of consumers or affect as much consumption of gas as possible. The circumstances vary in undertakings owing to the different classes of consumers, the consumption per consumer, and the financial position of the undertaking.

Gas Charges Report.

Any person setting out seriously to consider for the first time a new tariff should study the Report of the Committee on Gas Charges issued by the National Gas Council in 1928. The Report shows in its Appendix "E" (prepared by a Sub-Committee consisting of Mr. G. Evetts, Mr. E. J. Fottrell, and the writer) the definitions of multi-part tariffs and approximate allocations of costs for the purpose of compiling scientific multi-part tariffs. These approximate allocations have remained unchallenged and therefore may be taken as fulfilling their purpose of enabling undertakings to apply them to their own accounts in order to obtain a general indication of the proportions of total costs which fall under the respective parts of two-part, three-part, and four-part tariffs.

The following are the results of the application by a certain undertaking of the allocations set out in the said Appendix "E" to its own costs:

	Per Therm. d.
Average cost for all sales	7·5 net
Four-part—	
Customer charge—23s. per meter	2·2
Manufacturing demand	1·4
Distribution "	1·5
Commodity	2·4
	7·5
Three-part—	
Customer charge—23s. per meter	2·2
Manufacturing and distribution demand	2·9
Commodity	2·4
	7·5
Two-part—	
Service charge—31s. per meter	3·3
Commodity	4·2
	7·5

The customer and service charges include the cost of supplying meters—*i.e.*, the meter rental is included in the Customer and Service Charges—but the cost of stoves and fittings is excluded—*i.e.*, the rentals for these would be separately charged and should provide the costs involved in maintenance, interest, and depreciation.

Mr. Scarth, Joint Accountant of Gas Light and Coke Company, in his able Paper given before the London and Southern Junior Gas Association in February last, sets out a similar set of multi-part charges for another undertaking.

The three and four-part tariffs are too complicated to apply to any but very special cases, and therefore I do not propose to submit any tariffs of these types.

It is desirable, however, that each undertaking should analyze its accounts so that the equitable rates may be known and followed to some extent. As already pointed out, the present position as between classes of consumers is not equitable, and so long as there are not minimum charges it cannot be equitable. What is desired by each undertaking is a tariff or tariffs which will result in increasing the consumption by existing consumers and obtaining new business, and it will be found that these results will not be achieved by a strict observance of scientific rate structure. It is desirable to follow the scientific position only so far as it does not retard business.

The very able "Memorandum on Methods of Charge," prepared by Mr. E. J. Fottrell and recently issued by the National Gas Council, with the approval of the Joint Co-Ordinating Committee should also be studied, together with the statements made from time to time by Colonel W. M. Carr, Senior Vice-President of The Institution of Gas Engineers, regarding tariffs introduced at Stretford and other statements which can be studied by reference to the Technical Journals.

Many tariffs other than the flate rate have been put into operation, and these are being collated by the National Gas Council and probably will be available to members at an early date. Therefore, there is no need to waste time

TABLE I.—*Comparison of Quantities of Gas Sold and Numbers of Consumers, 1928 and 1933.*

	1928.					1933.				
	Gas Sold.		Consumers.		Consumption per Consumer. Therms.	Gas Sold.		Consumers.		Consumption per Consumer. Therms.
	Quantity in Therms.	% of Total Gas Sold.	Numbers.	% of Total.		Quantity in Therms.	% of Total Gas Sold.	Numbers.	% of Total.	
Domestic—										
Ordinary	7,376,103	30·0	57,555	32	128	6,875,120	27·5	56,905	28	121
Prepayment	8,253,034	33·6	108,429	60	76	9,162,091	36·5	127,654	64	72
	15,629,137	63·6	165,984	92	94	16,037,211	64·0	184,649	92	87
Industrial and commercial	7,599,351	31·0	14,873	8	511	7,344,324	29·4	15,079	8	459
Public lighting	1,331,705	5·4	(*a*)	..	(*b*)	1,603,305	6·6	(*a*)	..	(*b*)
	24,560,193	100·0	180,857			24,984,840	100·0	200,628		
(*a*) Number of lamps			21,337					25,044		
(*b*) Consumption per lamp					62					64

in setting out tariffs which are in operation in various parts of the country.

Tariffs for Industrial and Commercial Consumers.

I propose, however, to submit to you some figures and tariffs calculated for an undertaking in an industrial area where a census of consumers and consumptions was taken in 1928 and again in 1933. Some comparisons of the two are made in Table I.

Attention is drawn to the following features of Table I.:

(*a*) Domestic consumption represents roughly 64% of the total sales for all purposes in both years, and the number of domestic consumers represents the large proportion of 92% of the total number.

(*b*) The domestic consumption in 1933 shows a decrease per consumer as against 1928.

(*c*) Industrial and commercial consumption represents 31% of the total in 1928 and 29·4% in 1933, while the number of such consumers in both years is 8% of the total.

(*d*) The total industrial and commercial consumption shows a decrease in 1933. This is referred to later.

(*e*) The sale for public lighting in total and per lamp shows an increase in 1933.

Table II. shows the sales through ordinary meters graded as to annual consumptions.

With regard to Table II. attention is drawn to the following features:

(*a*) 53½% of the domestic ordinary consumers purchase in aggregate only 24% of the total gas consumed by that group; 45½% of the industrial and commercial consumers consume only 4% of the sales to that class and 52% of the total numbers of consumers consume only 14% of the total gas sold through ordinary meters, and in no case included in the 52% does an individual consumer use more than 100 therms per annum.

(*b*) ½% of the number of industrial and commercial consumers each consume over 10,000 therms per annum and represent in total 42½% of the gas sold to that group and 21½% of the total gas sold through ordinary meters for all purposes.

(*c*) The total consumptions by the ordinary meter domestic consumers and by industrial and commercial consumers are practically equal.

It is clear from Table II. that the undertaking has a very large number of small consumptions and a small number of very large consumptions.

TABLE II.—*Analysis of Annual Sales* (1928).

[Excluding sales through Prepayment Meters and for Public Lighting].

Therms per Annum.	Domestic (Ordinary Meters).				Industrial and Commercial.				Total Through Ordinary Meters.			
	Consumers.		Consumptions.		Consumers.		Consumptions.		Consumers.		Consumptions.	
	No.	%	In Therms.	%	No.	%	In Therms.	%	No.	%	In Therms.	%
0– 50	12,307	21·38	392,286	5·32	3,909	26·28	89,925	1·19	16,216	22·39	482,211	3·22
50– 100	18,527	32·19	1,378,218	18·68	2,860	19·23	211,050	2·78	21,387	29·53	1,589,268	10·62
		53·57		24·00		45·51		3·97		51·92		13·84
100– 150	11,446	19·89	1,531,696	20·77	2,016	13·55	248,460	3·27	13,462	18·59	1,780,156	11·89
150– 200	6,497	11·29	1,118,984	15·17	1,418	9·53	246,091	3·24	7,915	10·93	1,365,075	9·12
200– 250	3,312	5·75	736,407	9·98	930	6·25	207,620	2·73	4,242	5·86	944,027	6·31
250– 300	1,806	3·14	492,133	6·67	635	4·27	174,412	2·30	2,441	3·37	666,545	4·45
300– 350	1,113	1·93	359,338	4·87	416	2·80	134,544	1·77	1,529	2·11	493,882	3·30
350– 400	718	1·25	268,984	3·65	322	2·17	120,167	1·58	1,040	1·44	389,151	2·60
400– 450	487	0·85	205,918	2·79	258	1·74	109,046	1·44	745	1·03	314,964	2·10
450– 500	349	0·61	165,535	2·25	201	1·35	95,531	1·26	550	0·76	261,066	1·75
500– 550	254	0·44	134,323	1·82	177	1·18	93,022	1·23	431	0·59	227,345	1·52
550– 600	159	0·28	91,324	1·24	147	0·99	84,519	1·11	306	0·42	175,843	1·17
600– 650	120	0·21	74,834	1·02	134	0·90	83,736	1·10	254	0·35	158,570	1·06
650– 700	93	0·16	62,656	0·85	108	0·73	72,898	0·96	201	0·28	135,554	0·90
700– 750	85	0·15	61,916	0·84	84	0·57	60,834	0·80	169	0·23	122,750	0·82
750– 800	48	0·08	37,174	0·50	78	0·53	60,340	0·79	126	0·17	97,514	0·65
800– 850	43	0·07	34,826	0·47	59	0·40	48,687	0·64	102	0·14	83,513	0·56
850– 900	28	0·05	24,508	0·33	63	0·42	55,623	0·73	91	0·13	80,131	0·54
900– 950	26	0·04	23,964	0·32	59	0·40	53,003	0·70	85	0·12	76,967	0·51
950– 1,000	19	0·03	18,501	0·25	43	0·29	41,918	0·55	62	0·09	60,419	0·40
1,000– 2,000	109	0·19	135,599	1·84	520	3·50	720,209	9·49	629	0·87	855,808	5·72
2,000– 3,000	5	0·01	10,949	0·15	182	1·22	438,645	5·78	187	0·26	449,594	3·00
3,000– 4,000	2	0·01	6,948	0·10	60	0·40	208,299	2·74	62	0·09	215,247	1·44
4,000– 5,000	2	0·00	9,082	0·12	44	0·30	197,942	2·61	46	0·06	207,024	1·38
5,000– 6,000	..	..	..	..	26	0·17	142,847	1·88	26	0·03	142,847	0·96
6,000– 7,000	..	..	..	..	19	0·13	122,085	1·61	19	0·03	122,085	0·82
7,000– 8,000	..	..	..	..	18	0·12	134,147	1·77	18	0·02	134,147	0·90
8,000– 9,000	..	..	..	..	8	0·05	68,871	0·91	8	0·01	68,871	0·46
9,000–10,000	..	..	..	..	4	0·03	36,592	0·48	4	0·00	36,592	0·24
10,000 up	..	..	..	..	75	0·50	3,238,288	42·56	75	0·10	3,238,288	21·59
	57,555	100·00	7,376,103	100·00	14,873	100·00	7,599,351	100·00	72,428	100·00	14,975,454	100·00
No. of meters in excess of No. of consumers	0·97%				8·1%							

The undertaking was faced with the necessity of offering better terms for large consumptions which were being steadily lost. From one consumer it had a communication to the effect that in two departments the consumption had been gradually decreasing from 240,000 therms per annum, and in future it would be only 70,000 owing to replacement of gas by other fuels. The communication added that this was the general tendency throughout the works in view of the cost of town gas. Reductions in consumption were also taking place in other large works in the area. Something had to be done. With the 1928 figures before it the undertaking had to decide upon a new price policy.

The following step rate charges were then operating:

Ordinary Domestic and Industrial Consumers.	Gross Price per Therm.	Discount.	Net Price per Therm.
	d.	%	d.
Consumption per quarter—			
0 to 2,000 therms . .	8	10	7·2
2,000 to 50,000 ,, . .		15	6·8
50,000 therms upwards . .		20	6·4
Gas engines		20	6·4

To give a flat rate reduction all round of 0·2d. net per therm entailed a reduced revenue of £21,000 per annum, and would have done little or nothing to arrest the decline in the industrial load.

Instead the following tariffs were compiled with particular regard to giving benefits to industrial and commercial consumers:

price, and other modifications have been made with the result that to-day the tariff is as follows:

10s. per quarter net per service pipe and gas at—

—	Published Price per Therm.	Rebate.	Discount.	Net Price per Therm.
	d.	d.	%	d.
First 20,000 therms .	7·8	1½	10	5·67
Next 30,000 ,, .		1⅞		5·445
,, 20,000 ,, .		2		5·22
,, 10,000 ,, .		3		4·32
,, 20,000 ,, .		3¾		3·645
Excess		4		3·42

Under this scale 89 therms per quarter must be consumed per service pipe before the tariff is an advantage as against the flat rate.

The blocks included as part of the tariff were for the purpose of meeting keener competition which arose after the introduction of tariff B.1 in the cases of some very large consumers.

The adoption of a service charge per service pipe was an attempt to graduate the charge and had the effect of excluding many multiple shops, the consumption in which, taken separately, did not justify a reduction in price.

A special furnace price of 2·475d. net per therm, rising and falling with the price of coal, for quantities of 100,000 therms per annum guaranteed for a period of years to be

Block Tariffs—For All Ordinary Meter Consumers.

[Gas in Blocks of Therms per quarter. Prices Net per Therm.]

—	Tariff A.1.		Tariff A.2.		Tariff A.3.	
Blocks.	Therms.	Price.	Therms	Price.	Therms.	Price.
		d.		d.		d.
First	0– 50	7·2	0– 25	7·2	0– 500	7·2
Next			25– 50	7·0		
, ...	50– 200	7·0	50– 150	6·8		
, ...	200– 1,000	6·8	150– 300	6·6	500– 1,000	6·8
,, ...	1,000– 2,000	6·6	300– 1,000	6·4	1,000– 5,000	6·4
,, ...			1,000– 5,000	6·2		
,, ...	2,000–10,000	6·4	5,000–10,000	6·0	5,000–20,000	6·0
,, ...	10,000–40,000	6·2	10,000–40,000	5·8	20,000–50,000	5·7
,, ...	40,000–80,000	6·0	40,000–80,000	5 6		
	Over ,,	5·8	Over ,	5·4	Over ,,	5·4
Benefit to consumers—	Domestic (Ordinary).	Industrial and Commercial.	Domestic (Ordinary).	Industrial and Commercial.	Domestic (Ordinary).	Industrial and Commercial.
Number benefiting	15%	47%	46%	54%	0·1%	4%
Annual consumption of consumers benefiting	40 ,,	94 ,,	77 ,,	96 ,,	0·2 ,,	65 ,,
Amount of benefit—total	£1,065	£7,812	£3 596	£15,800	£20	£8,682
Per consumer benefiting . . .	2s. 5d.	22s. 2d.	2s. 8d.	39s.	5s. 11d.	261s. 6d.

Two Part Tariffs—For All Ordinary Meter Consumers.

[Service Charge in each case 10s. per quarter per Service Pipe. Gas in Blocks of Therms per quarter. Prices Net per Therm.]

	Tariff B.1.		Tariff B.2.		Tariff B.3.	
	d. Therms.		d. Therms.		d.	
	6·3 net for 1st 2,000		5·85 net for 1st 50,000			
	5·85 . next 48,000					
	5·4 ,, excess		5·4 ,, excess		5·4 for all gas	
Number of therms per service per quarter at which benefits start	134		89		67	
	Domestic (Ordinary).	Industrial and Commercial.	Domestic (Ordinary).	Industrial and Commercial.	Domestic (Ordinary).	Industrial and Commercial.
Consumers benefiting in respective classes	1·3%	8·8%	4·1%	14·8%	8·1%	20·5%
Annual consumption of consumers benefiting	7·9 ,,	62·7 ,,	17·5 ,,	75·9 ,,	27·0 ,,	81·6 ,,
Amount of benefit—total	£631	£10,811	£2,408	£15,164	£5,444	£25,705
Per consumer benefiting . . .	16s. 10d.	165s. 4d.	20s. 3d.	138s. 1d.	23s. 5d.	168s. 4d.

Of the foregoing tariffs it was considered that two-part tariff B.1 was the best to adopt in all the circumstances, the other tariffs involving either too great a loss of revenue or were not sufficiently attractive to large consumers. If and when circumstances permitted it would be simple to convert two-part tariff B.1 into B.2 or B.3. Although it could not be attractive to many domestic consumers, it was decided that it should be open for their acceptance.

Since the introduction of two-part tariff B.1 in 1930 there has been a reduction of 0·2d. per therm in the flat rate taken or paid for and consumed in furnaces scheduled in the contract has also been offered since the introduction of the two-part tariff. With this form of contract an undertaking is required from the consumer that agreed quantities for other purposes than the scheduled furnaces will be continued and paid for at the flat rate or the two-part tariff rate.

The numbers to whom the two-part tariff now in operation would be of benefit are 2,377 domestic and 2,196 industrial consumers. As a matter of fact, the numbers who have availed themselves of the tariff are much smaller.

TABLE III.—*Domestic Consumption Through Ordinary Meters Per House and Per Room, 1928 and 1933.*

Rooms in House.	1928. Consumers. No.	1928. Consumers. %	1928. Consumptions. Total.	1928. Consumptions. %	1928. Consumptions. Per House.	1928. Consumptions. Per Room.	1933. Consumers. No.	1933. Consumers. %	1933. Consumptions. Total.	1933. Consumptions. %	1933. Consumptions. Per House.	1933. Consumptions. Per Room.
			Therms.		Therms.	Therms.			Therms.		Therms.	Therms.
1 . . .	156	0·27	9,516	0·1	61	61	271	0·48	16,045	0·2	59	59
2 . . .	1,300	2·26	85,011	1·2	65	33	1,148	2·01	76,992	1·1	67	59
3 . . .	9,552	16·60	790,068	10·7	83	28	7,554	13·25	586,014	8·5	78	26
4 . . .	15,707	27·29	1,488,733	20·2	95	24	14,677	25·75	1,316,277	19·2	90	22
	26,715	46·42	2,373,328	32·2	88	25	23,650	41·49	1,995,328	29·0	84	24
5 . . .	12,853	22·33	1,405,270	19·0	109	22	15,365	26·96	1,654,216	24·1	108	22
6 . . .	6,466	11·23	1,061,899	14·4	164	27	8,575	15·05	1,139,153	16·6	132	22
7 . . .	4,849	8·43	807,890	11·0	167	24	4,852	8·51	819,651	11·9	169	24
8 . . .	2,875	5·00	557,713	7·5	194	24	2,060	3·61	435,813	6·3	211	26
9 . . .	1,596	2·77	381,288	5·2	239	27	1,080	1·90	277,222	4·0	257	29
10 . . .	881	1·53	241,331	3·3	274	27	646	1·13	208,225	3·0	322	32
11 . . .	368	0·64	121,297	1·6	330	30	250	0·44	97,526	1·4	390	35
12 . . .	442	0·77	182,451	2·5	413	34	239	0·42	97,401	1·4	407	34
13 . . .	104	0·18	41,237	0·5	396	31	59	0·10	30,200	0·4	512	39
14 . . .	213	0·37	94,606	1·3	444	32	98	0·17	51,026	0·8	521	37
15 . . .	41	0·07	19,630	0·3	479	32	26	0·05	14,292	0·2	550	37
Over 15 . . .	152	0·26	88,163	1·2	580	31	95	0·17	55,067	0·9	580	33
	57,555	100·00	7,376,103	100·0	128	25	56,995	100·00	6,875,120	100·0	121	24

Only about 900 industrial and commercial consumers—though this is being gradually increased—and 250 domestic consumers have signed contracts. The domestic consumers who contracted have since transferred to the domestic tariff introduced at a later date and which will be referred to shortly. On introducing the two-part tariff B.1 a letter was written to every consumer who would benefit, drawing his attention to the advantage to him of the tariff, and this was followed up by a personal call. When the tariff was amended, letters were again sent out and calls made and salesmen had instructions to obtain contracts for the two-part tariff wherever there would be benefit to the consumer. The experience has been that consumers will not risk paying the service charge except where it is clear that they will gain a substantial advantage—even in some cases where immediate substantial advantages were shown consumers would not contract. Of course, in many cases the savings were small, and for a small advantage consumers would not transfer to the two-part tariff and take the risk of the service charge. Particularly was this the case where in the summer quarters they would be paying (with the service charge) a little more than if on the flat rate, although on the whole year a gain would ensue.

While the number of consumers on the two-part tariff is comparatively small, representing only 6% of the total industrial and commercial consumers, the gas sold in 1933 on this tariff represented 44% of the total gas sold to industrial and commercial consumers.

Domestic Tariffs.

Last year, it was felt that something which would be more attractive to a larger number of domestic consumers, who still represent, in total, the largest volume of the sales of any class must be attempted.

A census of consumers was again taken, and Appendix "A" shows an analysis of all classes of consumers, the numbers in each class and the quarterly consumptions, and Table III. shows a comparison of the numbers and consumptions of domestic consumers through ordinary meters in each size of house in 1928 and 1933.

Attention is directed to the following features of Table III.:

(*a*) The large percentages of ordinary consumers living in houses of 4 rooms and under, although, as a result of slum clearances, the total number is shown to be decreasing.

(In the case of prepayment consumers the percentages of those living in 4 rooms and under is greater, being fully 75% of the total.)

(*b*) Consumption rises with the size of house up to 15 rooms.

(*c*) The consumption per room is higher in many cases in the larger sizes of houses.

Block (Room) Tariffs for Domestic Consumers.

[1st and 2nd Blocks for 4 rooms and under rising approximately 10 therms per additional room up to 15 rooms.]

Quarterly Blocks. Winter Therms.	Summer Therms.	Consumers Benefiting.	Tariff C.1. Consumers' Benefits. Amount.	Per Consumer.	Tariff C.2. Consumers' Benefits. Amount.	Per Consumer.	Tariff C.3. Consumers' Benefits. Amount.	Per Consumer.	Tariff C.4. Consumers' Benefits. Amount.	Per Consumer.	Tariff C.5. Consumers' Benefits. Amount.	Per Consumer.
			d.		d.		d.		d.		d.	
			1st Block 7·02 net		7·02		7·02		7·02		7·02	
			2nd ,, 6·12 ,,		5·67		5·22		..		..	
			Excess 5·22 ,,		5·04		4·86		5·04		3·6	
			£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.
(*a*) 30	25	Ordinary, 35%	5,966	6 0	8,467	8 6	9,846	9 10				
		Prepayment, 25 ,,	2,781	2 0	4,048	2 11	5,316	3 9				
			£8,747	3 8	£12,515	5 2	£15,162	6 4				
(*b*) 30	20	Ordinary, 43%	7,027	5 7	9,972	7 11	11,956	9 6	13,012	10 5	22,518	17 11
		Prepayment, 35 ,,	4,200	1 11	6,000	2 8	7,200	3 3	7,829	3 6	13,549	6 1
			£11,227	3 2	£15,972	4 7	£19,156	5 6	£20,841	6 0	£36,067	10 4
(*c*) 25	20	Ordinary, 50%	8,642	6 1	11,151	7 10	14,458	10 2				
		Prepayment, 35 ,,	5,000	2 3	6,400	2 11	8,400	3 9				
			£13,642	3 9	£17,551	4 10	£22,858	6 3				
(*d*) 20	15	Ordinary, 59%	11,938	7 1	15,634	9 3	19,337	11 6				
		Prepayment, 51 ,,	9,015	2 5	11,806	3 8	14,602	4 6				
			£20,953	4 3	£27,440	5 7	£33,939	6 11				

(*d*) Generally, the consumption per house was less in 1933 than in 1928 in the smaller houses and higher in the larger houses.

(The consumption per prepayment consumer in the same period decreased from 76 to 72 therms per annum.)

An attempt was made to design one simple tariff which would be attractive to a large percentage of the domestic consumers and be at least as attractive to the industrial and commercial consumers as the two-part tariff then in operation. Several tariffs were calculated, but in each case it was found that their operation would mean a greater loss of revenue than could be faced.

Attention was therefore directed to an entirely separate and distinct tariff for domestic consumers who have not the same potentialities for increasing their consumptions as have industrial and commercial consumers. Calculations on a rough basis of present standard requirement per house were made. The result would not of course mean the same price for the same number of therms for each consumer, but as the principle of what the business will carry operates in railway and electricity charges, why not in gas charges? In the case of one electricity undertaking known to the writer the charges under the various tariffs for 100 units per annum are as follows:

	s.	d.
Lighting of premises other than residences and shops	33	4
Shop tariff	23	0
Domestic tariff	19	2
Heating, cooking on premises other than residences	17	1
Storage water heating	5	10
Special contracts for industrial and commercial purposes	various	

Combined Two-Part and Room Blocks.

TARIFF D.

6d. per room (minimum 2s.) per quarter service charge.

Gas, 1st and 2nd blocks (for 4 rooms), in winter 30 therms, in summer 20 therms.

1st block, 7·8d. gross per therm, *less* 1d.	= 6·12d. net.	(disct. 10%)
2nd ,, do.	1½d. = 5·67d.	,,
Excess do.	2·2d. = 5·04d.	,,

The consumers' benefit would be practically the same as Tariff C.2 prices and (*b*) blocks.

TARIFF E.

Two-Part—

10s. per quarter service charge to all domestic ordinary consumers and gas at 3½d. net per therm.

6s. per quarter service charge to all prepayment consumers and gas a 5d. net per therm.

This showed the following benefits to consumers:

—	% of Number.	Amount.	
		Total.	Per Consumer.
		£	s. d.
Ordinary	26	28,629	38 3
Prepayment	11½	3,770	6 0
	16	£32,399	23 8

It was eventually decided to adopt a block system for domestic consumers based on the number of rooms per house, which possessed the following attractive features:

(1) It could be put into operation with all domestic consumers without having to obtain their consent, and therefore for practical purposes would become a compulsory tariff.

(2) It could be applied to prepayment consumers by giving increased rebate.

(3) It would provide the slogan "The more gas used—the cheaper the price."

(4) A Room Block system was in operation for domestic consumers by the undertaking's competitors.

The actual tariff adopted was C.2 prices and (*b*) blocks, which involved a potential loss of revenue which it was considered could be released. It also had the advantage that it could easily be made more attractive as and when circumstances permitted by lessening the size of the blocks and/or the prices for the blocks.

The following is the full tariff:

The "Domestic Tariff" is based on the number of "Assessable Rooms" in each house, the following rooms being included in the term "Assessable Rooms":

Kitchen	Drawing Room	Nursery
Breakfast Room	Bedrooms	Library
Dining Room	Dressing Rooms	Study
Lounge	Attics (if furnished)	Smoke Room

Other rooms (but excluding sculleries, bathrooms, lavatories)

Number of Assessable Rooms.	1st Block of Therms per Quarter at the Published Gross Price for the Time Being. 7·8d. gross. 7·02d. net.		Next or 2nd Block of Therms per Quarter at 1½d. per Therm Less than 1st Block. 6·3d. gross. 5·67d net.		Therms in Excess of 1st and 2nd Blocks at.
	Each Quarter ending March and Dec.	June and Sept.	Each Quarter ending March and Dec.	June and Sept.	
4 or less	30	20	30	20	2·2d. per therm less than 1st block
5	40	25	40	25	
6	50	30	50	30	
7	60	40	60	40	
8	70	50	70	50	
9	80	60	80	60	
10	90	70	90	70	
11	100	80	100	80	
12	110	90	110	90	
13	120	100	120	100	
14	130	110	130	110	
15 and over	140	120	140	120	5 6d. gross 5·04d. net

On this tariff 43% of the ordinary domestic and 35% of the prepayment consumers will receive benefits—34% of ordinary consumers obtain the advantage of the 2nd block price only, and 9% the benefit of it and the excess price. The blocks are so arranged that the percentage of consumers obtaining advantages gradually rises with the increase in size of house.

The reasons for making different sized blocks for winter and summer quarters were:

(*a*) The difficulty experienced in persuading consumers to contract on the two-part tariff system who would not obtain a benefit in summer quarters showed it psychologically desirable to make a difference between summer and winter on the block tariff.

(*b*) The consumption by domestic consumers is 57% in winter and 43% in summer.

(*c*) The competitive industry in the district also operates the principle of differentiating between summer and winter quarters.

Public Lighting.

The competition which exists for public lighting makes it desirable to have special tariffs for this class of business. It is suggested that the quantity consumed in individual lamps should be considered as the important factor and therefore each lamp be considered as the unit. In many cases where the service pipes, pillars, and lanterns are provided by the undertaking, and the consumption per hour is small and the annual burning hours also small, the remuneration is quite inadequate. The incentive for larger units and longer burning hours should be provided by low prices on the larger consumptions per lamp. In many cases our competitors desire only the large consumption lamps and like to avoid the capital expenditure involved in the small consumption lamps. If the charge is kept up on the small consumption lamps the gas undertaking puts itself into a better position to compete for the large consumption lamps, with the same average financial result.

A block tariff or a two-part tariff is suitable for this class of business. The size of block, prices of the blocks, and service and commodity charges, and also whether there be a variation between the winter and summer blocks, are matters for the undertaking to consider with a view to offering such terms as are most likely to increase this branch of their business. A block rate has been adopted by the undertaking previously referred to, because it could be put into operation without special agreements being entered into with the local authorities.

Results.

Now what of the results of the operation of these tariffs? Although as many consumers as expected have not taken advantage of the two-part-cum-blocks tariff, undoubtedly it has been successful not only in checking the serious loss in sales which had set in among the very large consumers but is now enabling increased sales to be made. As has

been observed with regard to Table I., the total sales in 1933 for industrial and commercial purposes are a little less than in 1928. This is the result of the trade depression in the district becoming worse and worse up to 1932 when industrial gas sales were at their lowest. In the case of six industrial consumers their combined consumptions decreased from 909,000 therms in 1928 to 661,000 therms in 1932, notwithstanding that the improved tariff and the creation of an Industrial Sales Department had stopped the substitution of gas by oil and electricity and had secured certain new uses for gas. The consumption by the same six consumers improved in 1933 to 802,000 therms and in 1934 to 1,121,000 therms. What the reduction up to 1932 would have been without the introduction of these two factors is somewhat unpleasant to contemplate. Trade improved during 1933 and again in 1934, in which latter year the industrial and commercial consumption exceeded that of 1933 and 1928. The consumers who were on the two-part tariff at the end of 1934 consumed in 1929 (the year before the introduction of the tariff) 3,072,000 therms. The same consumers used 3,228,305 therms in 1933, or 5% increase, and 3,545,121 therms in 1934, or 15% increase over 1929. The special furnace consumptions are not included in these figures. Since the introduction of the two-part tariff no industrial appliance then in existence has been lost to any competitor, and on the other hand many processes have been won to gas from competitors. That the two-part tariff has been an advantage in sales to industrial consumers the directors have not the slightest doubt.

The domestic tariff was only put into operation in September last, and it is therefore too early to correctly judge results. However, after sending letters to those ordinary consumers who would benefit to the extent of 5s. or more per annum, calls are being made upon them by salesmen, and up to the present in over 5% of the calls orders for additional appliances have resulted. If the consumptions of those consumers be estimated at 60% above the average shown in Table III., the estimated increased consumption by the additional appliances would result in an increased sale to those consumers of 20%. Many cases are known where existing appliances which were not previously in use have been brought into service and greater use made of appliances already connected as a direct result of the tariff. It has also been found that the block tariff has been very helpful in obtaining extended public lighting contracts for increased numbers of lamps and larger consumptions per lamp. What is not known with regard to all three tariffs is how much consumption has been retained which would have been lost but for the introduction of the improved methods of charge.

Conclusion.

In considering the introduction of a new tariff the important items are (*a*) the estimated possible loss of revenue; (*b*) the number of consumers to whom the proposed tariff will prove attractive; (*c*) the quantity of gas used by consumers who will benefit; and most important (*d*) the consumption likely to be retained and gained.

The most appropriate time to make a change in any method of charge is obviously when surplus profits are available for disposal and therefore concessions can be offered, and experience clearly indicates that more benefit is derived by releasing revenue for tariff purposes than flat rate reductions, as the flat rate does not provide any incentive to increased consumption, besides perpetuating the lack of equity inherent in that method.

Where sufficient net revenue cannot be released or risked to provide attractive tariffs, the undertaking should consider whether in its circumstances the existing flat rate should not be increased, and thus make possible the introduction of a tariff which will be attractive to many of their consumers as against the flat rate—*i.e.*, make the uneconomic consumers become more nearly economic consumers. This should be thoughtfully and courageously considered, not forgetting that more business may be lost if the economic consumer continues to be charged above his economic price than will be the case if the uneconomic consumer is charged a little more.

The quality of a tariff should not be judged by the number of consumers who will benefit, but by the sale of gas it is likely to conserve and increase, and with limited resources at your disposal the question arises will you gain more by having a medium price for a large number of consumers, or a low price for a smaller number? The most attractive block tariff is one block at a high price and the second or excess quantity at a substantial reduction—the greater the reduction the greater the chances of increased sales, and the most attractive two-part tariff is one with a reasonable and graduated service charge and a very low commodity rate.

A graduated block room tariff, and a graduated room service charge, do not involve so great a loss of revenue when giving benefit to the same number of consumers as block or two-part systems which are not so graduated; and a block system with several blocks enables the undertaking to offer in the last or excess block a lower price than would otherwise be possible.

The number of consumers who will benefit by a block system depends upon the size of the first block. Where the average consumption per consumer is large the first block can be larger than in the case of a small consumption per consumer and give benefit to the same percentage of consumers. Where there are two blocks or more and an excess it is a matter for consideration as to the size of the blocks after the first one. The amount of difference in price between the various blocks is also a matter requiring careful consideration—*i.e.*, whether it is thought that a greater increase in consumption will be gained by a small concession to the larger number of consumers in the second block or a larger reduction to the smaller number affected by the subsequent block? In the undertaking referred to the salesmen, while their experience of the block room tariff referred to is very limited, consider that whatever is done on intermediate blocks the last price must be a low one in order to attract large consumption heating.

The number of consumers to whom a two-part tariff will be a benefit depends upon the amount of the service charge and the difference in amount per therm between the flat rate price and the commodity price—*e.g.*, if the flat rate price be 10d., the two-part tariff service charge 10s. per quarter, and the commodity price 4d., the number of therms to be consumed before an advantage is gained on the two-part tariff is 10s. ÷ 6d. = 20 therms. If, however, the flat rate charge is 7d., the calculation is 10s. ÷ 3d. = 40 therms with a consequential reduction in the number of consumers to whom the tariff will be attractive.

If any new tariff leaves the present flat rate untouched, there will be a loss of net revenue at the commencement unless there are exceptional circumstances. Increases in sales do not come automatically except to a small extent as a result of the introduction of attractive tariffs. Moreover it is not sufficient just to advertise the tariff whether two-part or block. The consumer must be told of its effect on him individually, and be persuaded individually to use more gas, and this takes a great deal of time and increased staff. Many consumers will thank you for the concession and leave it at that without increasing their use of gas—in many cases this is because their social circumstances are such that they are glad to have the saving for other purposes.

If the present price be 7d. per therm and concessions are given on a new tariff equal to 0·2d. per therm on total sales, there will of course be a decrease in revenue for the same quantity of gas. To obtain the same gross revenue, it will be necessary to sell 2·94% more gas; and in order to provide the same net revenue it will be necessary to sell 4·6% more gas, if the additional gas can be supplied at a cost of 2·5d. per therm. If the present price be 10d. per therm, the same concession and cost of gas will require increased sales of 2·04% and 2·74% respectively. Of course, if the additional gas costs more than 2·5d. per therm, it will require a higher percentage of increased sale to provide the same net revenue.

After experience with both block and two-part systems the undertakings salesmen's opinions are—and I agree with them—that for domestic consumers the block system is the better because it can be put into operation without having to obtain the consent of the consumer, whereas on a two-part tariff the service charge requires to be sold to the consumer, and their experience is that domestic consumers look upon it with a certain amount of suspicion and feel a grievance if in summer quarters they are likely to pay more than on the flat rate basis; the consumers understand a simple block rate; goodwill is created by informing the consumer that without his doing anything he will in future be charged less for the same quantity of gas and that additional quantities will be at a reduced rate, and further, the difficulties connected with the collection of a service charge from prepayment consumers are avoided. Other reasons in its favour are set out immediately following two-part tariff E shown earlier in the paper.

With regard to industrial and commercial consumers, the salesmen's opinions are—and again I agree—that for large industrial consumers the two-part tariff is better than a block tariff because these consumers are accustomed to the system and it is easier for their Accounts departments to allocate costs inasmuch as the service charge, if per meter or service, is easily costed against the department concerned along with the commodity; and further, the commodity price only is taken into account by the department when considering extensions. Where a block system is in operation the allocation to departments is not so easily done, and in at least one case known to the writer the departments, much to their disgust, are costed at the first block rate. For the small industrial and commercial con-

sumer, the salesmen are of opinion that there is not much to choose between the two methods but the preference would be towards the block system for this class of consumer, owing to their fear of loss through the service charge. On the basis of the opinions expressed above it would appear that for undertakings without large industrial consumers the block system is to be preferred, but in the case of undertakings having large consumptions it is desirable to have the block system for the domestic consumers and a two-part tariff for the industrial and commercial consumers.

Where the two types of tariff are introduced the question of equity between the two arises. In such a case a consumer on a two-part tariff with a service charge of 10s. a quarter and a commodity price of 4d. per therm would pay, if his consumption exceeded 30 therms, the same sum as a consumer on a block tariff of the first 30 therms at 8d. and all excess at 4d. per therm. It is desirable that there should be rough equity between the two if practicable—though as shown earlier in this Paper in connection with our competitor's tariffs, this phase appears to be absent. In some cases to make the two types of tariffs strictly equitable on comparison involves the release of more revenue than is available.

It may be found to be desirable to introduce in addition special rates for gas used for special purposes.

The writer does not agree with a service charge or a block charge based on rateable value. Such a basis involves too many anomalies, even in the same rating area, and when there are several rating areas within the undertaking's district it cannot be satisfactory, and further it is liable to periodic alteration.

The step rate is out of date, and not so effective as a block or a two-part tariff in negotiating new business. In addition it is inconvenient owing to adjustments necessary in border line cases.

There are various other forms of tariffs which can be used and have been put into operation, but in my opinion the two-part and the block systems are the simplest and best. Which of the two is better, or whether it is desirable to have both, is a matter for settlement by each undertaking.

The ultimate object ought to be to get the last block price, and in the case of a two-part tariff the commodity price, down to such a figure as will make attractive the use of gas for continuous domestic space and water heating and also encourage full industrial application. While this is being developed the problem of coke utilization must be seriously studied by the Industry.

It must be remembered that whatever tariff is offered to domestic consumers with ordinary meters, the same must be offered to prepayment consumers except that in the latter case the extra sum of rental of appliances and extra cost of collection may be added. The collection from prepayment consumers of a service charge in respect of a two-part tariff is a real difficulty in industrial areas.

It is theoretically desirable to include the meter rent in the service charge of a two-part tariff, but this raises the question of whether the undertaking has power to detach the sum representing the meter rent in the service charge from the charge for gas, and which if not excluded may affect the dividend in certain basic price cases.

Most of the promotional tariffs which have been adopted in this country are still in the experimental stage, and we may all find that adjustments are desirable, but do not let this deter any undertaking which has not adopted such a tariff from tackling its own problem, even though the ideal is not attained at first.

I have no hesitation in saying that properly designed tariffs giving a generous bonus in respect of gas taken in excess of standard quantities are undoubtedly an aid to increasing the sale of gas per consumer, and if the Gas Industry is to show marked progress in its sales in the future it will be largely through the medium of tariffs; and in my opinion those undertakings which do not provide suitable tariffs cannot hope to develop their sales. We have an excellent commodity to sell and we give good service, but these must be backed by intensive selling at the right price.

APPENDIX "A."

Analysis of Consumers and Consumptions—1933.

—	Consumers.		Therms.								
	No.	% of Total.	December-March.	% of Total.	April-June.	% of Total.	July-September.	% of Total.	October-December.	% of Total.	Total.
Prepayment	127,654	64	2,773,987	30	1,912,195	21	2,129,706	23	2,346 203	26	9,162,091 36·67%
Ordinary, domestic	56,995	28	2,237,483	32	1,550,463	23	1,352,205	20	1,734,969	25	6,875.120 27·52%
Industrial	1,658	1	818 579	27	633,019	21	652,255	22	922,797	30	3,026,650 12·11%
Engines	258	..	42 107	25	39 216	24	39 239	24	44,952	27	165,514 0·66%
Garages	589	..	28,855	38	16,846	22	10,333	13	20,323	27	76,357 0·31%
Fish and chip shops	364	..	68,396	24	71,874	25	80,181	27	70,140	24	290,591 1·16%
Restaurants and cafés, &c.	135	..	103,201	27	93,800	24	92,717	24	95,346	25	385,064 1·54%
Butchers and bakers	942	1	73,753	29	60,740	23	57,362	22	67,061	26	258,916 1·04%
Amusement halls	170	..	33,066	37	19,264	21	12,718	14	24,623	28	89,671 0·36%
Hotels and institutions	1,636	1	288,390	35	177,197	21	124 791	15	239,264	29	829,642 3·32%
Boarding houses	124	..	28,463	31	21,645	23	18,999	20	24,682	26	93,789 0·38%
Shops	7,761	4	616,041	38	336 216	21	208,650	13	447,274	28	608,181 6·44%
Offices	2,341	1	165,240	43	82,344	23	20,527	5	113,758	29	381,869 1·53%
Bulk supply	1	..	40,470	28	38,607	21	28,326	22	30 677	29	138,080 0·55%
Public lighting	..	..	529,155	33	212,668	13	251,774	16	609,708	38	1,603,305 6·41%
	200,628	100	7,847,186	32	5,266,094	21	5,079,783	20	6.791,777	27	24,984 840 100

[Our report of the discussion which followed the reading of Mr. Ridley's Paper will be published in next week's "JOURNAL."]

Bombay Gas Company, Ltd.

Steady Progress Maintained

The Ordinary General Meeting of the Bombay Gas Company, Ltd., was held at the London Offices, Moorgate Station Chambers, E.C. 2, on Wednesday, May 1, 1935—Mr. WILLIAM GRAHAM BRADSHAW, C.B.E. (the Chairman of Directors), presiding.

The SECRETARY (Mr. E. Comber) read the notice convening the meeting, together with the report of the Auditors; and the Directors' report and statement of accounts for the year ended Dec. 31, 1934, were taken as read.

THE CHAIRMAN'S ADDRESS.

The CHAIRMAN, in moving the adoption of the report and accounts, said: It is with great pleasure that we meet you once again and are able to present to you an account of the Company which I feel sure you will regard as satisfactory.

Our General Manager and Engineer in Bombay reports that the year under review was free from the disturbing features in the way of riots and civil commotions which in previous years militated seriously against the trade of the city. This welcome change has helped to produce more confidence—a fact which is substantiated by the extensive building operations that are being undertaken in different parts of the Island whereas, when conditions were so unsettled, people were afraid to spend money on improvements. The markets and bazaars, we are informed, are reporting better trading results, and the shipping business tends to show an upward trend, although much of the business of Bombay has been diverted to the State-aided ports on the coast. However, the Government of India is examining the question with a view to restoring to Bombay some of its former trade.

Favourable Trade Balance.

The exports from India during 1934 exceeded the imports by some £19,000,000 sterling, while the increase in the export of gold was £7,000,000, so that the favourable trade balance was £26,000,000. The Indian Budget recently introduced in the Indian Legislative Assembly showed a surplus of 327 lakhs of rupees whereas a surplus of only 10 lakhs was expected. In consequence, various concessions in taxation have been made, including a reduction in income-tax. An indication of the faith of the public in the future of India is illustrated by the recent offer of shares by the Reserve Bank of India, which was heavily over-subscribed. This is the more remarkable as no applicant is to receive more than 5 shares of Rs.100 each.

The rehabilitation of trade will necessarily be a slow matter, but one can say that there are distinct signs that the outlook for the current year is more hopeful than at any time during the past five years.

Sale of Gas.

The Company is taking full advantage of the improved conditions in Bombay, and the General Manager reports that he had a most strenuous and active year. He states that all departments, including the fittings department, have been fully engaged. A large amount of work has been accomplished, and he considers that the business of the Company is now more firmly established than at any time during its history. Provided that no untoward incidents occur to upset the present peaceful state of affairs in Bombay, it would appear that we should be able to continue to increase our sales of gas and our profits in the future. That does not mean that business will automatically come to us without our seeking it. We shall have to fight hard for new consumers as competition becomes keener year by year.

We must bear in mind also the monetary position of the people of Bombay—that they are still compelled to exercise the strictest economy—a necessity which is due (as I mentioned last year) to their reduced spending power brought about by heavy taxation and the high cost of living. As trade improves further and money circulates more freely than has been the case during the last few years we are hopeful that the efforts of our staff to induce the public of Bombay to become "gas minded" will reap the reward they deserve. To this end the General Manager has advertised judiciously, has held cookery classes in our well appointed showroom, which he tells us is very popular, has exhibited gas apparatus at the important Grand Scientific Exhibition recently held in Bombay, and in many other ways has been educating the public to appreciate the advantages to be gained by using gas for cooking and heating purposes. The Board, too, at his request have sanctioned special sliding scales of rates for gas consumed by large consumers with the object of encouraging them to use more gas.

You will gather that no stone is being left unturned to further the interests of gas. That these efforts are commencing to bear fruit is borne out by the increase in 1934 in the sale of gas for heating purposes, amounting to practically 12 million cu.ft., or an increase of 4·7% over that of 1933 and no less than 10·6% over that of 1932. There is no doubt that had it not been that the public were still compelled to practise economy, the sale of gas would have been higher. As it was, the total gas sales produced £2,109 more following an increase of 2·3% in the total gas sold. Against this the increase in the quantity of gas made is only 0·9%, which points to the fact that there has been an improvement in the amount of gas unaccounted for. The improvement did not commence until the latter half of the year; nevertheless the reduction in this figure over that of 1933 is 8·3%. It follows that the sale of gas per ton of coal is higher, the figure being 15,167 cu.ft. against 14,795 cu.ft. the previous year—an evidence of very good work and also of good coal. The number of consumers has increased by 350, and there have been issued some 1,834 pieces of gas apparatus such as cookers, geysers, hotplates, gas rings, &c., which is 334 more than the total issued in 1933. It is interesting to note that the total sold or let on hire during the last two years is 3,334 appliances—an evidence of increasing appreciation by the public of the usefulness of gas and a good augury for the future.

Public Lighting.

Before I review the accounts and balance-sheet you will be gratified to hear that the contract for public lighting has been renewed for a further period of five years from March 1, 1935. The terms and conditions ruling in the new contract are practically the same as those in the one recently expired. Our General Manager and Engineer, is to be congratulated on the able manner in which he conducted the negotiations with the Municipal officials for this renewal, while Mr. Blackmore, our Public Lighting Superintendent, is a zealous and able officer who has done much to ensure that our public lighting is always maintained in the highest degree of efficiency. In proposing to the Corporation the acceptance of the Company's tender, the Municipal Commissioner stated that the Company had given complete satisfaction in the past, and even during the riots they had done their best to carry out the terms of the contract faithfully. He also mentioned that they had co-operated with the Municipality in reducing the cost of lighting wherever practicable.

The Accounts.

We will now turn to the accounts and balance-sheet for the year under review. With the exception of the increases in the revenue from gas sales, rentals of meters and stoves, residuals, and certain unavoidable increases in expenditure, there is little that calls for special comment; but I will explain briefly the main features.

The capital expenditure stands at practically the same as last year, all expenditure having been provided for out of revenue. The capital per million cu.ft. of gas sold is £797, which is the lowest figure of the Company on record. It is only some ten years ago that the figure was £981, and in 1913 it was £1,289 per million. During 1934 nearly three miles of additional mains were laid and paid for out of revenue. We carbonized 388 tons more coal than during 1933, but the total cost was £775 less, due (as I mentioned last year) to our having contracted for the supply of coal at reasonable rates per ton. You will like to know that we have practically covered our coal requirements for the duration of the public lighting contract at economic rates.

The upkeep and maintenance of the Works cost some £594 more—money well and wisely spent. The General Manager reports that our Works are thoroughly up-to-date and efficient and of a capacity sufficient for the Company's probable requirements for many years to come.

The cost of distributing the gas is higher by £3,016 and is due chiefly to the extra cost of renewing and repairing old or defective mains and services and to depreciation of meters, cookers, and geysers which is so essential in these days of changing styles. Rents, rates, and taxes are lower by £872, the reduction being mainly on account of income-tax being less.

On the other side of the revenue account there is an increase of £2,109 in the revenue from the sale of gas. There is also an increase from the rentals of meters and stoves of £636.

The sale of residual products has yielded £2,081 more, of which coke produced £352 more than last year. The market has not been an easy one, the competition from the product of coke ovens having been extremely keen. However, after utilizing what was necessary for the furnaces and the water gas plant, the General Manager was able to dispose of the balance, leaving a small stock of 199 tons at the end of the year. An increase in sales for "Domestic" and "Industrial" purposes is the chief cause of this satisfactory result and gives a hopeful outlook for the current year. We sold 13,751 tons of coke and breeze, or 680 tons more than during 1933.

As regards tar, both Bengal and Japan sent regular shipments of their product to Bombay for sale at lower prices than our own commodity, yet it is to the credit of the General Manager that he managed to dispose of 341,566 gallons, which is almost the whole of the production. The prices obtained per gallon were better than those ruling last year, the increased revenue from this source being £1,729. The total revenue was increased by £4,822, which I think you will agree is satisfactory.

The balance of the revenue account shows that we have earned our dividend without any help from other sources. The exchange profit on remittances shows a small advantage over

that of last year, due to more cash having been remitted at slightly better rates of exchange.

After allowing for the interest paid, the appropriation to the reserve and renewal funds and the interim dividend of 3½% paid in November last, there remains a sum of £55,657 13s., which includes £39,000 brought forward from last year. A final dividend of 4½% (less income-tax) is recommended, making 8% (less income-tax) for the year. The final dividend will absorb the sum of £13,500 and will leave £42,157 13s. to be carried forward, or an increase of £3,157.

The Balance-Sheet.

As regards the balance-sheet, there is one aspect to which I should like to invite your attention—viz., the financial position of the Company. At the end of 1933 we had £29,591 cash in hand, and at the end of 1934 you will see that we had £18,910 in cash and £20,000 invested in gilt-edged securities, which is, as you will recognize, a much more satisfactory state of affairs than owing the Bank £40,000, as was the case a few years ago.

As to the prospects of the Company, given peaceful conditions the business of the concern will, I think, continue to expand in conjunction with the maintenance of trade improvement which, in turn, will affect the financial position of the public. The recovery of trade will be a very gradual process, and in the meantime we must be content with slowly but surely increasing the sale of gas. The boom in the building trade will prove of benefit to the Company, but it should not be overlooked that the various schemes of development now taking place will require the enlargement of some of our mains.

Well, gentlemen, that is all I have to say this year regarding the affairs of the Company, but I cannot sit down without saying how greatly indebted we are for the satisfactory working results now before us to the untiring efforts of our General Manager and Engineer in Bombay (Mr. W. T. Lane), his Engineering Assistants, and the other members of both the European and Indian staffs. We have in Bombay a very efficient, energetic, and loyal band of workers, both English and Indian, and all credit is due to them for the able manner in which they, each and all, have contributed towards the results for the past year. I have spoken in former years in eulogistic terms (and rightly so) of the characters and abilities of individual members of our staff in Bombay, and I think it is only necessary on this occasion to say that my remarks last year regarding both the European and Indian staffs hold good to-day. Mr. Lane has nothing but praise to speak of the conduct of our Indian workers. In spite of many temptations, they continue to give us willing and loyal service and show by their excellent work that they appreciate the fact that their interests are bound up in the prosperity of the Company and that they value the good relationship which exists between the Management and themselves and are well satisfied with the conditions of their employment.

We are served in London by our Secretary, Mr. Comber, in a conscientious and efficient manner, and his staff supports him in the same spirit. I cannot speak too highly of the able and wholehearted assistance which Mr. Comber gives to the Board, and especially to myself, in the conduct of the business of the Company.

The CHAIRMAN then formally moved:

> That the report of the Directors and the statement of accounts for the year ended Dec. 31, 1934, now submitted, be and the same are hereby received and adopted.

The DEPUTY-CHAIRMAN (Mr. H. H. Macleod) seconded the resolution, and, there being no response to the Chairman's invitation to shareholders to ask any questions regarding the accounts, the motion was put to the meeting and carried unanimously.

Dividend.

The CHAIRMAN thereafter moved:

> That a final dividend for the year ended Dec. 31, 1934, of 4½% (less income-tax at the rate of 2s. 3·1308d. in the £) be now declared, payable on and after May 4, 1935, making with the interim dividend of 3½% (less income-tax) a dividend of 8% (less income-tax) for the year.

This was seconded by Mr. STANLEY H. JONES and unanimously agreed to.

Re-Election of Directors and Auditors.

Mr. A. M. PADDON, M.Inst.C.E., moved the re-election of the retiring Directors, Mr. W. G. Bradshaw and Mr. Stanley H. Jones, remarking that their Chairman had been a Director of the Company for thirty years, and for the last ten years he had been in the office of Chairman. That term of service, said Mr. Paddon, was co-terminal with his own as an ordinary Director, so that he was therefore competent to tell the shareholders of the great influence Mr. Bradshaw had had over the affairs of the Company since he assumed the office of Chairman. If they were to compare the results to-day with those of ten years ago they would appreciate the work which Mr. Bradshaw had done, and it had been a pleasure to watch the way in which their Chairman had brought the accounts of the Company from a very unfavourable state into the form in which they saw them to-day. In Mr. Jones they had the Chairman of the Oriental Gas Company, which operated in Calcutta. As such they might, perhaps, see in him a rival, but actually they had a man thoroughly conversant with Indian affairs. He had much pleasure in moving the re-election of both these gentlemen.

The DEPUTY-CHAIRMAN seconded this resolution, which was carried unanimously, and the CHAIRMAN briefly acknowledged this renewal of their confidence on behalf of himself and his colleague.

On the proposition of Mr. H. F. HILLS, seconded by Mr. F. R. SMITH, the Company's Auditors, Mr. Alfred Morland, F.C.A., and Mr. F. J. Bradfield, F.C.I.S., were re-appointed for the ensuing year at the same remuneration as heretofore, and Mr. F. J. BRADFIELD returned thanks on behalf of himself and Mr. Morland.

Vote of Thanks.

Mr. F. W. CRUTTENDEN proposed a hearty vote of thanks to the Chairman and Directors for their services during the year. He thanked the Chairman for his concise review of the affairs of the Company, while he also expressed the thanks of the shareholders to the other Directors and fully endorsed what had been said in regard to the staff.

Captain W. J. LIBERTY, in seconding the vote of thanks, referred with particular pleasure to the success of the Company in securing a further public lighting contract in the face of keen competition with electric lighting. They were indebted not only to the General Manager, Mr. Lane, but also to Mr. Blackmore, the Public Lighting Superintendent, whom he knew well, and to all the members of the staff.

Works in Excellent Condition.

Major HERIOT R. GLEN, M.C., in associating himself with the vote of thanks, remarked that he had recently visited their Works. He had been returning from Colombo, and had specially taken a steamer which called at Bombay, in order that he might see Mr. Lane. He had spent a couple of hours on the Gas-Works and had found them in excellent condition. He was particularly impressed with the good state of their gasholders. After he had seen the Works he visited the Showrooms, which he had not seen before. The previous premises, he said, were somewhat inadequate; but there was nothing inadequate about the present Showrooms, which aroused his envy. He had also been interested to observe that the staff in Bombay, in addition to catering for the European population, undoubtedly set out to cater for the Indians, and he was much impressed to see the number of appliances available which were specially designed to appeal to the Indian consumers. This was an admirable move, and he was not surprised to hear that the Indian staff got on so well.

The CHAIRMAN briefly acknowledged the vote of thanks on behalf of himself and his co-Directors.

The SECRETARY acknowledged the expression of thanks on behalf of Mr. Lane and both his European and Indian staffs, and added that the vote of thanks to the London staff was also much appreciated. He knew from his long experience with the Company that those in Bombay thoroughly deserved this appreciation of their efforts to further the interests of gas. It was very gratifying to listen to the remarks of the Chairman regarding his (Mr. Comber's) services, and in reply he could only thank him for his encouraging words and say that it always had been and always would be his aim to assist both the Chairman and his colleagues in their guidance of the Company's affairs.

The meeting then terminated with a vote of thanks to the Chairman for presiding, this being accorded on the motion of Captain LIBERTY.

Athletic and Social

Richmonds Social and Recreation Club.

The Annual Meeting of the Social and Recreation Club of Richmonds Gas Stove Company, Ltd. (Radiation Ltd.), was recently held at Warrington. The social side of the Richmond Company at Warrington has become an important and helpful part in their organization, and the Social and Recreation Club now has a membership of 1,200.

There is an excellent bowling green, and an additional one is nearing completion, four hard tennis courts, putting green, badminton court, and other sports accommodation on the grounds adjoining the Works. There are also ladies' and men's hockey teams, together with a junior football team. Other sports sections include swimming, cycling, angling, and a very flourishing horticultural society.

An imposing pavilion provides accommodation for social intercourse, billiards, table tennis, &c. Two billiards teams are in the local league, and for the season just ended one occupied second position. Two bowling teams are also affiliated to the Warrington and District League.

The Club has had a very successful year, and the social side of the employees of the Company is admirably catered for.

GAS CONSOLIDATION LIMITED.

Authorised.	CAPITAL:	*Issued or to be issued.*
£250,000	in 4 per Cent. Redeemable Cumulative Preference Shares of £1 each	£250,000
£250,000	in Ordinary Shares of £1 each	£250,000
£500,000		£500,000

200,000 Ordinary Shares were issued for cash at par in July, 1934.

ISSUE OF

250,000 4 per Cent. Redeemable Cumulative Preference Shares of £1 each at par, and 50,000 Ordinary Shares of £1 each at 22s. per Share.

The Prospectus published in "The Times" on 30th April, 1935, showed (*inter alia*) that:—

1. The Company was formed in June, 1934, to acquire interests in Gas and other Companies with the object of forming geographical groupings of Gas Companies. The Company is primarily a Holding Company deriving its revenue from the interest and dividends on its investments.

2. The Company has acquired investments at a total cost of £312,550, and the Directors propose to employ the surplus funds of approximately £180,000 to be provided by this issue in the purchase of similar investments.

3. The Annual Revenue, before deduction of Income Tax, available for distribution is estimated at £23,486, equivalent to 2.34 times the annual dividend requirements (£10,000) on the 250,000 4 per Cent. Redeemable Cumulative Preference Shares, the balance (£13,486), representing 5.39 per cent. on the £250,000 Ordinary Share Capital.

Directors:

JULIAN DAY, Director of South-Eastern Gas Corporation Limited, and Chairman of Severn Valley Gas Corporation Limited, Chairman.

HUGH C. BISCHOFF, Barrister-at-Law.

Major-General GUY P. DAWNAY, C.B., Director of Dawnay, Day & Co., Ltd.

GEORGE EVETTS, M.Inst.C.E., M.I.Mech.E., M.Cons.E., Consulting Engineer.

G. M. GILL, M.I.Mech.E., M.Inst.Gas E., Consulting Engineer.

H. E. IBBS, Consultant Accountant to the Gas Light and Coke Company.

Bankers:

MARTINS BANK LIMITED, 68, Lombard Street, E.C. 3.

Brokers:

Messrs. ROWE & PITMAN, 43, Bishopsgate, E.C. 2.

The Subscription Lists for the above Issue were opened on Wednesday, May 1st, 1935, and were closed at 10.5 a.m. on the same date.

Gas Markets and Manufactures

Stock Market Report

(For Stock and Share List, see later page)

The Jubilee celebrations were uppermost in the minds of most investors last week, with the result that the volume of business on the Stock Exchange was reduced to smaller dimensions in nearly all sections. In the absence of both buyers and sellers, however, prices remained firm and the general tone at the close was distinctly bright. A feature of the week's business was an outburst of activity in the shares of aviation companies and those concerns connected with this industry, and values sharply appreciated, though profit-taking later led to some reaction.

Despite the holiday mood, business in Gas stocks and shares was a trifle heavier than the previous week, and the prices of recorded transactions showed a hardening tendency, though quotations for the most part remained unchanged. Of the few upward movements the highest occurred in Alliance and Dublin with a gain of 3 points to 133, business being recorded at 137½; South Metropolitan ordinary went up another point to 133½, and at the local Exchange Liverpool ordinary gained 2 to 138. On the adverse side, British 7% preference dropped sharply by 7½ points to 155 and Commercial fell another 2 to 111½.

An issue of interest to local investors is that of £75,000 5% maximum stock by the Directors of the Croydon Gas Company. The issue is reserved for the Company's consumers and employees and is at £114%, giving a return of £4 7s. 8d.%. The stock, originally known as "D" stock, was first issued in 1904 and the 5% dividend has been maintained since that time. Moreover, this rate cannot be reduced until the dividend on the sliding-scale stock (which is at present 7%) falls below 2½%—a somewhat remote contingency—when the dividend payable would be twice that on the sliding-scale stock. The Directors are giving special consideration to smaller applications, and these, in multiples of £5, should be sent to the Company not later than 11 a.m. on Friday next, May 10.

The Directors of the South-Eastern Gas Corporation have announced a final dividend of 3% on the ordinary shares, making 6% for the year to March 31. A similar rate was passed for the Corporation's first accounting period for the 15 months to March, 1934. At the time of writing the shares are still *cum div.* and obtainable at round about 28s., at which price the yield works out at £4 5s. 8d.%

Current Sales of Gas Products

The London Market for Tar Products.

May 4.

The prices of Tar Products remain steady at about the following levels:

Pitch, about 40s. per ton f.o.b.

Creosote, 5½d.

Refined tar, 4d. per gallon in bulk at makers' works.

Pure toluole, 2s. 1d. to 2s. 3d.; pure benzole, 1s. 7d. to 1s. 8d.; 95/160 solvent naphtha, 1s. 5d.; and 90/160 pyridine, about 5s. 9d.—all per gallon naked at makers' works.

Tar Products in the Provinces.

May 7.

The average prices of gas-works products during the week were: Gas-works tar, 20s. to 25s. Pitch—East Coast, 38s. to 40s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 38s. to 40s.* Toluole, naked, North, 1s. 8d. to 1s. 9d. Coal-tar crude naphtha, in bulk, North, 6¼d. to 6¾d. Solvent naphtha, naked, North, 1s. 4¼d. to 1s. 4¾d. Heavy naphtha, North, 9¾d. to 10¼d. Creosote, *ex* works, in bulk, North, liquid and salty, 4⅜d. to 4¾d.; low gravity, 4⅝d. to 4¾d.; Scotland, 4⅝d. to 4¾d. Heavy oils, in bulk, North, 4d. to 4¼d. Carbolic acid, 60's, 2s. to 2s. 1d. Naphthalene, £10 to £11. Salts, 55s. to 75s., bags included. Anthracene, "A" quality, 2½d. to 3d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *May 4.*

Buying is only on a moderate scale and, while actual quotations are fairly steady, there is an easier tendency in certain departments.

Crude gas-works tar.—The actual value is 28s. to 30s. per ton *ex* works in bulk.

Pitch.—Values are purely nominal at 40s. to 42s. per ton f.o.b. Glasgow for export, and 40s. per ton *ex* works in bulk for home trade.

Refined tar is easy at 3d. per gallon naked at makers' works with competition extremely keen.

Creosote oil continues to hold its own and prompt supplies are small. B.E.S.A. Specification, 5d. to 5¼d. per gallon; low gravity, 5d. to 5⅛d. per gallon; and neutral oil, 5d. to 5¼d. per gallon; all f.o.r. in bulk.

Cresylic acid.—Very little business is being offered, but producers maintain prices. Pale, 97/99%, 1s. 2d. to 1s. 3d. per gallon; dark, 97/99%, 1s. to 1s. 1d. per gallon; and pale, 99/100%, 1s. 3d. to 1s. 4d. per gallon; all *ex* works.

Crude naphtha is valued at 4½d. to 4¾d. per gallon, according to quality and district

Solvent naphtha.—90/160% grade is 1s. 3d. to 1s. 3½d. per gallon, and 90/190 heavy naphtha is 10d. to 11d. per gallon.

Motor benzole may appreciate in sympathy with the increase on petrol, but meantime value is still 1s. 2d. to 1s. 3d. per gallon in bulk *ex* works.

Pyridines.—90/160 grade is 5s. 6d. to 6s. per gallon, and 90/140 grade, 6s. to 6s. 6d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s. d.		s. d.	
Crude benzole . . .	0 8½	to	0 9	per gallon at works
Motor ,, . . .	1 2	,,	1 2½	,, ,, ,,
90% ,, . . .	1 3	,,	1 3½	,, ,, ,,
Pure ,, . . .	1 6½	,,	1 7	,, ,, ,,

Contracts Advertised To-Day

Coal.

East Dereham Urban District Council. [p. 336.]
Morecambe and Heysham Gas Department. [p. 336.]
Wallasey Gas Department. [p. 336.]

Gas Showroom.

Atherton District Council. [p. 333.]

General Stores, Tools, &c.

Birmingham Corporation. [p. 334.]
Leeds Gas Department. [p. 334.]

Lighting Goods (Mantles, Lamps, Fittings, &c.).

Birmingham Corporation. [p. 334.]
Leeds Gas Department. [p. 334.]

Meters.

Leeds Gas Department. [p. 334.]

Pipes.

Leeds Gas Department. [p. 334.]

Tinplates.

Leeds Gas Department. [p. 334.]

Tinware for Cookers.

Leeds Gas Department. [p. 334.]

Water Softener.

Wallasey Gas Department. [p. 336.]

Gas Undertakings' Results for 1934

Newquay.

The Directors of the Newquay (Cornwall) Gas Company, Ltd., present accounts for the year ended Dec. 31, 1934, which show a balance of profit available for the payment of dividends of £1,705, which they recommend should be disposed of as follows: In payment of a final dividend of 5% on the original shares, making 10% for the year; a final dividend of 3½% on the additional ordinary shares, making 7% for the year, and in carrying forward the remaining sum of £803.

GLOVER-WEST VERTICAL RETORTS TO-DAY

At the present time the total of installations of Glover-West vertical retorts erected by this Company in Great Britain and Ireland stands at 246, and the total nominal daily gasmaking capacity of these reaches 342 million cubic feet. In the British Dominions 42 plants have been installed, their total nominal daily capacity being 69½ million cubic feet. In European countries there are 46 plants with a total nominal daily capacity of 62½ million cubic feet, and in other parts of the world, 30 plants with a total nominal daily capacity of 50 million cubic feet. The total of plants in service or in hand throughout the world is 375, and the corresponding total nominal daily gasmaking capacity 535 million cubic feet.

Orders for installations of Glover-West vertical retorts have been received during the present year from the gas undertakings of Kilsyth and Montrose in Scotland, Buxton, Slough, and Svendburg (Denmark). Plants at East Hull, Yeadon, and Bilston are amongst those recently put into service.

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MILES PLATTING, MANCHESTER, 10. Telephone: Collyhurst 2961. Telegrams: "Stoker, Manchester."

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Glover-West Vertical Retorts.

•

Westvertical Carbonizing Chambers.

•

All Types of Mechanical Fuel-handling Equipment.

•

Above and below are two views of the complete installation of Glover-West retorts with coal and coke handling units, erected at the works of the Stirling Gas Light Company, Scotland, in 1931. There are 16 retorts in this plant, with a nominal daily gasmaking capacity of 1,440,000 cubic feet.

STOCK AND SHARE LIST

Official Quotations on the London and Provincial Stock Exchanges

Issue. £	Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, May 3.	Rise or Fall on Week.	Transactions, Lowest and Highest Prices During the Week.
1,551,868	Stk.	Mar. 11	7	7	Alliance & Dublin Ord. ...	128—138	+3	137½
374,000	,,	Dec. 17	4	4	Do. 4 p.c. Deb. ...	90—100	...	...
557,655	,,	Feb. 18	7	7	Barnet Ord. 7 p.c.	165—170	...	...
300,000	1	Apl. 8	1/4½	1/9½	Bombay, Ltd.	27/6—29/6	—/6	27/6—28/9
178,480	Stk.	Feb. 18	9½	9½	Bournemouth sliding scale ...	220—230	...	...
550,050	,,	,,	7	7	Do. 7 p.c. max. ...	167—172	...	168½—171½
439,160	,,	,,	6	6	Do. 6 p.c. Pref. ...	147—152	...	...
50,000	,,	Dec. 17	3	3	Do. 3 p.c. Deb. ...	86—91	...	...
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	104—109	...	...
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	125—130	...	...
357,900	,,	Feb. 18	7½	7½	Brighton, &c., 6 p.c. Con. ...	170—175	...	175
649,955	,,	,,	6¾	6¾	Do. 5 p.c. Con. ...	153—158	...	155—156½
205,500	,,	,,	6	6	Do. 6 p.c. B. Pref.	145—150	...	...
1,487,500	,,	Feb. 4	5	5	Bristol, 5 p.c. max.	118—120a	...	...
120,420	,,	Dec. 17	4	4	Do. 1st 4 p.c. Deb. ...	102—104a	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	102—104a	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	122—124a	...	...
855,000	,,	Mar. 11	7	8	British Ord.	152—162	...	156—160
100,000	,,	Dec. 17	7	7	Do. 7 p.c. Pref.	150—160	—7½	150
350,000	,,	,,	5	5½	Do. 5½ p.c. "B" Cum. Pref.	114—119	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	97—102	...	...
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	111—116	...	...
100,000	10	22 May '33	6	6	Cape Town, Ltd.	1—3	...	1
100,000	10	6 Nov. '33	4½	4½	Do. 4½ p.c. Pref. ...	1—3	...	...
150,000	Stk.	Dec. 17	4½	4½	Do. 4½ p.c. Deb. ...	88—93	...	...
626,860	,,	Jan. 21	6	6	Cardiff Con. Ord.	130—135	...	137
237,860	,,	Dec. 17	5	5	Do. 5 p.c. Red. Deb.	105—110	...	...
157,150	,,	Feb. 4	5.	6½	Chester 5 p.c. Ord.	111—116b	...	...
98,936	1	Mar. 25	2/-	2/-	Colombo, Ltd., Ord.	1⅜—1⅞	...	...
24,500	1	,,	1/4½	1/4½	Do. 7 p.c. Pref. ...	20 6—22 6	...	...
609,204	1	Mar. 25	-/11·48	-/11·48	Colonial Gas Assn. Ltd. Ord.	20 —22 -	...	21/—21/4½
296,053	1	,,	1/3·30	1/3·30	Do. 8 p.c. Pref.	24/6—26/6	...	26/-
1,775,005	Stk	Feb. 4	5	6	Commercial Ord.	109—114	—2	109—112
475,000	,,	Dec. 3	3	3	Do. 3 p.c. Deb. ...	85—90	...	85
286,344	,,	Feb. 18	5	5	Do. 5 p.c. Deb. ...	123—128	...	...
807,560	,,	Feb. 18	7	7	Croydon sliding scale... ...	155—160	...	157
569,590	,,	,,	5	5	Do. max. div.	112—117	...	114
620,385	,,	Dec. 17	5	5	Do. 5 p.c. Deb.	125—130	...	126
542,270	,,	Feb. 18	7	10	Derby Con.	185—195c	...	...
55,000	,,	Dec. 17	4	4	Do. 4 p.c. Deb.	100—105c	...	...
239,000	,,	Feb. 4	5	5	East Hull Ord. 5 p.c. ...	111—116	...	...
181,625	,,	Feb. 4	6	6	East Surrey Ord 5 p.c. ...	131—136	...	133½
175,609	,,	Dec. 17	5	5	Do. 5 p.c. Deb. ...	120—125	...	...
1,002,180	,,	Mar. 11	†	†7	European, Ltd.	109—114	—1	109½—112
19,313,481	,,	Feb. 4	5⅔	5⅔	Gas Light & Coke 4 p.c. Ord.	27 —28 -f	...	27/3—28 0½
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	85—90	...	87—88
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	104—109	...	105½—107
6,102,497	,,	Dec. 3	3	3	Do. 3 p.c. Con. Deb. ...	88—93	...	90½—92
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	115—120	...	116½—117½
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	111—116	...	114—115½
270,466	,,	Feb. 18	6	6	Harrogate New Cons. ...	135—140	...	...
140,000	1	Mar. 25	1/7½	1/7½	Hongkong & China, Ltd. ...	1⅛—1⅛	...	...
213,200	Stk.	Feb. 18	6	6	Hornsey Con. 3½ p.c.... ...	128—138	...	...
5,600,000	,,	Oct. 22	14	10	Imperial Continental Cap. ...	210—220	...	216—219
223,130	,,	Jan. 21	3½	3½	Do. 3½ p.c. Red. Debs.	91—96	...	...
285,242	,,	Feb. 18	8½	8½	Lea Bridge 5 p.c. Ord. ...	172—182	...	...
2,167,410	,,	Feb. 18	6	6	Liverpool 5 p.c. Ord.... ...	136—140b	+2	...
245,500	,,	Dec. 17	5	5	Do. 5 p.c. Red. Pref. ...	105—110b	...	...
306,083	,,	Jan. 16	4	4	Do. 4 p.c. Deb.	104—107b	...	...
165,736	,,	Feb. 18	8	10	Maidstone 5 p.c. Cap. ...	185—195	...	...
63,480	,,	Dec. 17	3	3	Do. 3 p.c. Deb. ...	83—88	...	...
75,000	,,	Dec. 3	†10	†10	Malta & Mediterranean ...	205—215	...	...
392,000	—	Apl. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb. ...	100—105	...	...
231,978	Stk.	Feb. 4	5	5	M. S. Utility "C" Cons. ...	110—115	...	...
818,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	102—107	...	105—105½
360,075	,,	Dec. 17	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
148,955	,,	,,	5	†5	Do. 5 p.c. Deb. ...	125—130	...	...
125,000	—	Jan. 2	11/8	3½	Do. 3½ p.c. Rd. Rg. Bds.	98—101	...	...
675,000	,,	May 28	†6	††3	Montevideo, Ltd.	50—60	...	51
2,061,315	,,	Feb. 18	5	5¾	Newcastle & Gateshead Con.	25 —25/6df	...	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	106—107d	...	...
776,706	,,	Dec. 17	3½	3½	Do. 3½ p.c. Deb. ...	101¼—102¼d	...	...
277,285	,,	Oct. 8	5	5	Do. 5 p.c. Deb. '43 ...	105—107d	...	...
274,000	,,	Feb. 4	5	5	Newport (Mon.) 5 p.c. max....	108—110a	...	...
225,000	,,	Feb. 18	7½	7½	North Middlesex 6 p.c. Con.	170—175	...	...
396,160	,,	Feb. 4	5	5	Northampton 5 p.c. max. ...	105—110	...	...
300,000	,,	Apl. 29	†9	†7	Oriental, Ltd.... ...	167—172*	—3	168
416,617	,,	Dec. 17	8	8	Plym'th & Stonehouse 5 p.c.	167—172	...	...
504,416	,,	Feb. 4	8	8½	Portsm'th Con. Stk. 4 p.c. Std.	173—178	...	...
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	110—115	...	...
114,000	,,	Jan. 21	5	5	Preston 5 p.c. Pref.	108—113	...	...
1,736,968	Stk.	Feb. 18	6	6	Sheffield Cons.	142—144e	...	...
95,000	,,	Jan. 7	4	4	Do. 4 p.c. Deb.	103—106e	...	...
133,201	,,	Feb. 18	8½	5	Shrewsbury 5 p.c. Ord. ...	142—147	...	143
90,000	10	May 28	‡4	‡3	South African	3—4	...	...
1,061,779	1	Sept. 10	1/2½	1/2½	South East'n Gas Cn. Ld. Ord.	27/—29/-	...	28/—28 6
845,016	1	Mar. 11	-/10½	-/10½	Do. 4½ p.c. Red. Cum. Pref.	21 9—22 9	...	22/—22 7½
450,000	Stk.	Feb. 4	74·4	4	Do. 4 p.c. Red. Deb. ...	100—103	...	...
6,709,895	,,	Feb. 4	5	6½	South Met. Ord.	131—136	+1	133—135½
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf. ...	147—152	...	148½—150
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf. ...	104—109	...	106½—107
1,895,445	,,	Dec. 17	3	3	Do. 3 p.c. Deb.	87—92	...	88½—90
1,000,000	,,	Jan. 7	5	5	Do. 5 p.c. Red. Deb....	113—118	...	116—116½
209,820	,,	Feb. 18	8½	8½	South Shields Con	174—176d	...	...
1,543,795	,,	Feb. 18	6	6	South Suburban Ord 5 p.c. ...	128—138	...	...
512,825	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125	...	...
500,000	,,	,,	4	4	Do. 4 p.c. Pref. ...	102—107	...	...
888,587	,,	Dec. 17	5	5	Do. 5 p.c. Deb. ...	124—129	...	...
250,000	,,	,,	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
647,740	,,	Feb. 4	5	5	Southampt'n Ord. 5 p.c. max.	114—119	...	...
121,275	,,	Dec. 17	4	4	Do. 4 p.c. Deb.	102—107	...	...
350,000	,,	Feb. 4	5½	5½	Swansea 5½ p.c. Red. Pref. ...	115—120	...	118½
200,000	,,	Dec. 17	6½	6½	Do. 6 p.c. Red. Deb. ...	100—105	...	...
1,076,490	,,	Feb. 18	6¾	6¾	Tottenham and District Ord.	148—153	...	149—151½
409,835	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	131—136	...	132—134½
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125	...	...
199,005	,,	Dec. 3	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
369,774	,,	Feb. 4	7	7	Uxbridge, &c., 5 p.c.	150—155	...	...
108,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	118—123	...	122
1,326,700	,,	Feb.	7	7	Wandsworth Consolidated ...	155—160	...	155—158
1,371,373	,,	,,	5	5	Do. 5 p.c. Pref. ...	121—126	...	...
1,317,964	,,	Dec. 17	5	5	Do. 5 p.c. Deb. ...	126—131	...	...
238,300	,,	,,	26/8	4	Do. 4 p.c. Deb. ...	104—109	...	...
158,400	,,	Feb. 18	5	6g	Winchester W.& G. 5 p.c. Con.	116—121	...	...

Quotations at income-tax. :—a.—Bristol. b.—Liverpool. c.—Nottingham. d.—Newcastle. e.—Sheffield. f.—The quotation is per £1 of Stock. g.—Paid £3, including 10s. on account of back dividends. * Ex. div. † Paid free of ‡ For year.

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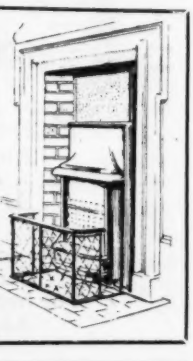

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BEN Battle was a soldier bold,
And used to war's alarms;
But a cannon-ball took off his legs,
So he laid down his arms!

Now as they bore him off the field,
Said he, "Let others shoot,
For here I leave my second leg,
And the Forty-second Foot!"

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